

THE
FUNGI
OF
MANITOBA

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THE FUNGI OF MANITOBA

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DIRECTOR OF THE IMPERIAL BUREAU OF MYCOLOGY AT
KING, ENGLAND

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PREFACE

IN accepting with the greatest pleasure the invitation to contribute a preface to this book my excuses, though not any justifications are that one of the authors, G. R. Bish, helped me in strenuous times in starting the Imperial Bureau of Mycology that of another, A. H. R. Buller I have long admired the many-sided activities, and that Dr. Dearness must occupy a very special place in the appreciation of all mycologists in the British Empire. It would have been easy to select someone better fitted to do so from familiarity with the subject but not so easy to find one more sincerely convinced of its importance than I am. Knowledge of the fungus flora of a region appears to me to be the foundation of all mycological work in that region applied as well as pure but it is not to be gained in a few months even in the older countries where most of the fungi have already been collected and named. Such a list as that contained in the following pages is, when based as this is on personal study, an expression of work arduous and extensive beyond what is readily realized. It postulates a knowledge of every group represented. The authors indeed form a team, each member with special competence in different parts of the undertaking. They form too an interesting combination of the amateur to whom the study of the fungi has been a hobby during a long life-time, the eclectic university professor probing the inner

secrets of these plants, and the worker in the field of applied mycology. The result is much more than a mere catalogue of the fungi of Manitoba—its value is multiplied by the notes on many of the species and by the discussions on plant geography, ecology, distribution, seasonal prevalence, habitat, and the like in the early sections, and the host and substratum indices at the end, the latter being of particular interest and likely to increase greatly the utility of the book as a field manual.

The systematic study of the fungi in the Dominions and Colonies of the British Empire has been, with some striking exceptions, much neglected. It began well for the founders of British mycology in the last century devoted much time to the study of material received in England from collectors overseas. Then there was a long period of depression due partly to a recognition of the imperfections of determinations based on chance collections in only partially explored areas, but more to the absence of good herbaria and other facilities for naming species in the regions concerned. It is only since the beginning of the present century that the attempt has been made in certain areas to surmount these difficulties. In Ceylon, South Africa, Australia, and elsewhere herbaria with good named collections have been built up, and in some of these areas the fungi are or are becoming fairly well known. The publication of the present list will place Manitoba at the head of these. The determination of approximately 2000 species in a region with so relatively scanty and uniform a plant cover and so rigorous a climate probably indicates that a higher percentage of the whole of the fungi present has been found than has been the case elsewhere—and incidentally helps

towards a realization of the probable richness in species of fungi of regions more congenial to their growth. In Manitoba the fungi are already twice as numerous as the flowering plants and Manitoba is not likely to be exceptional in this respect, though it appears to be the first of the overseas States to establish the fact.

The utility of regional lists of fungi is manifold. Not only is mycology a field and not the least interesting for nature study in which however the prospective student is hampered unless he can obtain in convenient form an indication of what he should seek but the scientific and the economic worker each has a need for such lists. Botanical science as a whole is bound to profit from a more exact knowledge of the geographical distribution ecology phenology and habitats of the fungi. Still greater is the need of the applied mycologist or plant pathologist for detailed information regarding the fungous flora of the region in which he works and to a certain extent also of regions from which dangerous fungi might be introduced. Until recently the destructive downy mildew of the hop was only known to be indigenous to Japan and Wisconsin. Within the past year it has been found attacking cultivated hops in British Columbia and from the reference to it in the following list it appears that it is an indigenous Manitoban fungus. The possible significance of this extension of the known natural range of the parasite is obvious. No doubt too, the notes on the rare or absent species and on those that perhaps find in Manitoba their northernmost limits of distribution are capable of an economic application of considerable practical importance. These are only a few of the many reasons why this list of the fungi of Manitoba is deserving of a warm welcome not alone within the

Province, but by mycologists in many other parts of the world. One may be permitted to hope that some of those whose opportunities lie in the less explored regions will be inspired to attempt a similar service to that which the authors of this book have so well performed.

E J BUTLER

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FIG. 1. Map showing the Flora Zones of Manitoba. Winnipeg (near the base of the map) is almost on the eastern edge of the shaded area at the confluence of two rivers (96° N., 49° W.). Lake and Rovers (not marked) are on the two railway lines which run eastward from southern Manitoba (near base of map on right-hand side). Highway 100 and Victoria Beach both marked are on Lake Winnipeg, at the north end and south end respectively. Brandon and Gilbert (both marked in the shaded area, are near 96° N. and 49° W. Swan River is in the west. The Province, just north of 49° N. Map by courtesy of V. W. Jackson.

FUNGI OF MANITOBA

I.

INTRODUCTION.

Canada, as is well known, is a large country, its area being slightly greater than that of its southern neighbour, the United States. Much of it has been settled only in the last few decades, and there are tens of thousands of square miles within its boundaries in which, up to the present, no botanist has ever set foot.

The University of Manitoba, of which two of the authors are members, established its Chair of Botany in the year 1904 and, since then, Saskatchewan, Alberta, and British Columbia, in succession, have each founded a provincial university provided with a Chair of Botany. As a result of the development of all these academic institutions a number of professional botanists have become resident in western Canada, and the time has now come when it is possible to begin a botanical survey of the huge territory lying to the north of the forty-ninth parallel of latitude and west of the Great Lakes. This survey is a task of great magnitude which must necessarily require the united efforts of many workers, both professional and amateur, for a long series of years.

Towards the accomplishment of such a botanical

surveys as that just suggested the authors¹ have made a study of the fungi of Manitoba, an account of which is included in the following pages. It is their hope that this contribution may not only advance the cause of pure Botany as envisaged by the mycologist, the ecologist and the student of plant distribution but that it may also prove of service to those phyto-pathologists who are engaged in the important work of combating plant diseases within the three great prairie Provinces of Manitoba, Saskatchewan and Alberta.

An attempt has been made to give a complete census of the known fungi of Manitoba. There can be no doubt that many other species which occur in

¹ The authors' names are joined in alphabetical order. John Dickinson of London, Ontario, has examined the material of several hundred species herein recorded. His wide and practical knowledge of Canadian fungi, reinforced by his large collection for comparison, has been of great assistance in promptly determining the more difficult species. A. H. B. Bailey has studied the fungi of Manitoba for a quarter of a century and has published many useful observations on them. His familiarity with the fungi of Great Britain and other European countries has enabled him to make comparisons between many Canadian and Old World species.

In co-operation with but no author, C. H. Bailey has acted as editor. Moreover, he has collected or assisted in collecting most of the species named and has had the opportunity of examining nearly all the specimens found by others and here recorded. From the first, he has borne the responsibility of determining the species or in case of doubt, of indicating specimens in these determinations. Most of the material upon which the List of Species is based has been obtained by at least two of the three authors.

The authors desire to express their appreciation to the National Research Council of Canada and to the University of Manitoba for support of the investigations recorded in this volume, which they so regard as a contribution to the proposed Dominion Survey of Canada.

the Province still remain to be discovered and that the List of Species must therefore be incomplete. However, the preparation of the List has involved much labour and no effort has been spared to make it as accurate as possible. We trust that, as a result of this publication, new workers will be attracted to the study of the fungi of western Canada.

The authors desire to express their best thanks to many contributory workers, in particular to those specialists who are mentioned in Section XIII in connection with the groups of fungi in which they are interested. From the first Professor V. W. Jackson of the Manitoba Agricultural College has given willing and valuable assistance in settling the identification of certain host plants. The members of the Dominion Rust Research Laboratory, Winnipeg, have shown constant interest and have helped with the work in many ways. As evidence thereof the names of Dr. Margaret Newton and of Messrs. I. L. Connors, W. L. Gordon, W. F. Hanna, T. Johnson, J. H. Craigie, and D. L. Bailey are frequently entered in the collectors' data and notes on the covers of the specimens. Professor W. P. Fraser, now of the University of Saskatchewan, collected and reported the names of many of the Uredinales. Although full data in respect to the various collectors are recorded on every herbarium packet, it has not been thought necessary to include them in the List of Species as here published except where a collector, other than the authors, has supplied all the material and data.

The new species of Manitoban fungi, published either in this volume or elsewhere, have their co-types in the Manitoba Agricultural College herbarium. Most of the types are in the herbarium of John Dearness.

at London, Ontario. Dr E A Burt of the Missouri Botanical Garden at St. Louis, Missouri, has the types of two Thelephoraceae. The herbarium of Dr J J Davis at Madison Wisconsin and that of the late C G Lloyd of Cincinnati (his herbarium has now been removed to Washington, D.C.) each contain a single type. Dr W F Hanna has his new species of *Sporobolomyces* in culture at the Dominion Rust Research Laboratory at Winnipeg. The new species of *Coprinus* are as yet only partially represented in the College herbarium. Duplicate specimens of many Manitoban fungi are in the herbaria of those mycologists who have assisted in the work of identification.

In the solution of the difficult problems of nomenclature which have arisen in preparing the manuscript of this volume for the press, the authors have aimed at a reasonable conservatism. Thus they have preferred names in current acceptance in the modern, although not necessarily the latest, mycological literature. Detailed descriptions are seldom given, except in respect to new species. Where a parasite is listed, the genus of the host is usually given without the species, but the specific name of every host plant is recorded in the Host Index of Parasitic Fungi. The names of the hosts and the range in spore size are given for most of the Fungi Imperfecti, and it is hoped that these data will enhance the usefulness of the book.

So far as a record of the regional distribution of fungi within the Province of Manitoba is concerned, these pages do no more than provide a modest beginning. The grounds of the Manitoba Agricultural College, together with the woods and fields immediately

surrounding them, are meant wherever the contraction "M A C." is used. This relatively small region is frequently mentioned, not because it is particularly rich in species, but because it is conveniently situated and has therefore been most thoroughly explored; a fungus listed only at M A C. may doubtless be found in many other localities within the Province.

As a rule, the places in which a species has been collected have been recorded, for such data often serve to throw light on the nature of the plant association to which the species belongs and the climatic, topographical and soil conditions of the locality. In this connection the reader is referred to Section II and, more especially, to Section IV.

In groups of fungi that have a brief fruiting season, e.g. Agaricaceae and certain Pezizales, the dates of collection have usually been recorded. Annotations, of necessity, has been limited, and only important economic or critical remarks have been retained in the text. Complete records are preserved in the herbarium at the Manitoba Agricultural College.

THE NATURAL FEATURES OF MANITOBA

Manitoba, which mycologically is a region of considerable interest, lies between the 49th and 60th parallels of north latitude its southern boundary extending from near 93° W. of Greenwich to beyond 101° and its northern boundary from 89° W. along the sea-coast of Hudson's Bay to 102° (Fig. 1). It is about half way between the Atlantic and the Pacific, and southern Manitoba is approximately at the centre of North America. The map facing page 1 indicates its general geographic, phytographic, and physiographic features. It should be noted that all our collections have been made in the southern half of the Province between the 49th and 54th parallels, and most of them south of the 51st.

The area of Manitoba is 251,832 square miles, of which Lake Winnipeg occupies over 8,600 square miles and other lakes a total of 8,000 square miles or more. This vast territory contains a comparatively limited phanerogamic flora, owing to its high latitude, its cold winters, and the lack of greatly varied physiographic features. Its woods appear thin and stunted to the visitor from warmer and damper regions. The first impression of a botanist who looks at Manitoba's position on the map is likely to be that the Province contains but few fungi. Nevertheless, since in its southern half there have been found 1,168 species of Angiosperms, 12 of Gymno-

sperms, 42 of Pteridophytes, and about 90 of Bryophytes.¹ it is evident that there must also be many saprophytic fungi to destroy the annual accumulation of dead parts of these plants. Furthermore the vascular plants provide hosts for many parasitic fungi, and it is of interest to discover which parasites occur near the limits of their host range. Since many species of phanerogams reach a portion of their northern, eastern, or western limits within the Province many fungi must also reach their corresponding limits there. Nearly every record of a fungus from Manitoba extends the known range of the species often for hundreds and sometimes for even thousands of miles.

The phanerogamic flora, one of the most important factors in the distribution of the fungi, consists in Manitoba of many of the north temperate herbs and shrubs together with a somewhat limited number of trees. Since many fungi have a necessary parasitic, mycorrhizal or saprophytic relation with particular species of phanerogams, the absence of familiar names of fungi from the List of Species may frequently be explained by the absence of the proper host plants. It may be of value to record that the native trees with which fungi have been found associated are the following: balsam fir, black and white spruces, jack pine, larch, the willows, three species of poplar, birch, elm, scrub oak, big skler, basswood, ash and several shrubby plants such as juniper, hawthorn, mountain ash, *Acer spicatum*, *Amelanchier*, *Prunus* spp. and *Elaeagnus*. The absence from Manitoba of beech, the larger oaks and maples and numerous other trees, shrubs and herbs of eastern and western Canada must limit materially the fungi to be found there.

¹ Figures compiled by Professor V. W. Juhnson.

Although the rocks exposed at the surface in eastern and northern Manitoba are of pre Cambrian age, yet we have to recognize that the present flora in its entirety must have reached the Province in times geologically very recent. The green plants now inhabiting Manitoba have arrived since the Pleistocene ice-sheet melted and disappeared some 25,000 years ago, and the fungi must have accompanied or followed them. Most of the fungi have been collected on ground formerly covered by Lake Agassiz.

Manitoba ranges in elevation from sea level at Hudson's Bay to something over 2,600 feet in the hills along the western boundary. The altitude records of our fungus collections may be approximated from the following readings: Norway House and Victoria Beach 760 ft. Winnipeg 750 ft., Lake of the Woods district 1,100 ft. Brandon 1,200 ft., and Duck Mountain about 2,600 ft. Collecting territories are described in Section IV, most of them can be found on the accompanying map (Fig. 1). Minaki and Kenora are situated in the extreme west of Ontario about 20 miles east of Manitoba.

Precipitation in Manitoba is frequently too low to provide favourable conditions for the development of fungi, its annual average ranges from 16 inches in the south west to about 22 inches around Winnipeg and Lake Winnipeg. A considerable proportion of this precipitation may come as snow. The humidity of the atmosphere is very low in winter and, as a rule, low in the summer. Temperatures range from an occasional day at 90° or even 100° F. in the summer to from 20° to even 40° below zero in the winter. The annual average at Winnipeg is 38.8° F.

III

GEOGRAPHICAL DISTRIBUTION

1. The Fungi of Manitoba compared with those of Europe.—Fungi are peculiarly cosmopolitan plants. Many species found in Manitoba occur in Europe, as is indicated by the fact that the names of eminent pioneer European mycologists, such as Persoon, Fries, Fuckel, and Berkeley, frequently appear on the Manitoba lists. It should be noted, however that many American species were sent across the Atlantic to be described and named by Fries and Berkeley. The majority of the American, including the Manitoban, species not known in Europe, carry the names of Schwounitz, Farlow, Peck, Ellis, Arthur and other American mycologists. It is hardly necessary to say that these authors' names are not a part of the names of the species but are usually added as an important guide to the original description. They are often broadly suggestive of the region where the fungus was first observed.

Most of the Myxomycetes listed here are also European, as might be expected from our knowledge of the fact that, in general, the members of this group have a very wide distribution throughout the world. About 85 per cent. of the Phycomycetes are known in Europe, the remaining 15 per cent. are principally Peronosporales of non-European hosts. Approximately 70 per cent. of the Ascomycetes occur in

Europe only about 55 per cent of the Sphaeriales are found there but some 80 per cent of the Protodisciales, Helvellales, and Pezizales are Old World species. In the Basidiomycetes, fully 60 per cent of the Agaricaceae were first collected in Britain and northwest Europe, and about 50 per cent of the Uredinales include Europe within their range. Approximately half of the Fungi Imperfecti are known in Europe or, so far as the chief subliteratures are concerned about 60 per cent of the Hypohymycetes, 30 per cent of the Melanconiales and 50 per cent of the Sphaeropsidales.

Of the 1 949 species of Fungi recorded for Manitoba, some 1 200 or about 60 per cent are found also in Europe. This percentage is of the same order as that for the Pteridophyta, another group of plants disseminated by microscopic, wind-blown spores, but it greatly exceeds that for the Phanerogamia, which owe their dissemination to relatively heavy seeds. As may be seen from the accompanying statistical Table, 69 per cent of the Pteridophyta of Manitoba occur also in Europe but of the Phanerogamia only 29.7 per cent (Pinaceae 16.7 Monocotyledoneae 36.2 Dicotyledoneae 17.6). In other words, 6 of every 10 species of Fungi, 7 of every 10 Pteridophyta, but only 3 of every 10 Phanerogamia occur in Europe as well as in Manitoba.

The contrast between the percentage of Fungi and that of Phanerogamia common to Europe and Manitoba becomes even more noteworthy when we exclude from the statistics the introduced species. The Phanerogamia growing without cultivation in Manitoba are given in the last published list (26) as 939 species, but, of these, 22 species (mostly weeds) have been introduced directly or indirectly from Europe, while

9 species have been introduced into Europe from North America. If we exclude these introduced species the percentage of Phanerogama common to both Europe and Manitoba becomes reduced from 29.7 to 21.8. Certain species of fungi (mostly "fungus-weeds," parasites of cultivated plants) have also been introduced from Europe into Manitoba, but the percentage, although apparently small, cannot be determined with accuracy.

Pteridophyta and Phanerogamia of Manitoba and the Number of Species common to Europe and Manitoba.

	Pterido- phyta	PHANEROGAMIA			Total Phanero- gamia
		Plants	Monocots (Includes)	Dicotyl. Malvaceae	
Native in both Europe and Manitoba	29	2	69	113	184
Introduced from Europe to Manitoba	--	--	13	73	86
Introduced from North America to Europe			1	8	9
Total number of species common to Europe and Manitoba	29	2	83	194	279
Total number of species recorded in Manitoba	42	12	226	702	939
Percentage of native plants found in Europe	69.0	16.7	32.6	18.2	21.8
Percentage of native and introduced Man- itoba species found in Europe	69.0	16.7	36.9	27.6	29.7

In the world, as a whole, there are far more known species of Flowering Plants than known species of

Fungi. Nevertheless, in Manitoba there have been found about twice as many Fungi as Flowering Plants. This seems to be due to the fact that, in general, Fungi have a wider range than Flowering Plants. Great Britain resembles Manitoba in having more species of Fungi than of Flowering Plants¹ and it would be interesting to know whether or not Fungi exceed the Flowering Plants in number in other areas of the world comparable with Manitoba and Great Britain.

2. The Fungi of Manitoba and of the United States. -

The great majority of the fungi reported in this work have been found in the United States and even the forty five new species also probably occur there. It may eventually be found that some Manitoban fungi are more northern species which do not extend southward but it is probable that any fungus recorded in Manitoba has a distribution which also covers some portion of the United States since all the phanerogams with which the Manitoban fungi have been found associated occur in some areas of that great country. It is possible however that certain vascular plants restricted to northern areas including parts of northern Manitoba may be found to support species of fungi not occurring south of the international boundary. In addition there are not a few fungi occurring chiefly or solely in their mature form in northern latitudes that carry on chiefly or solely by their quite unlike "un-

¹ The number of Phanerogams and Pteridophyta given in the *London Catalogue of British Plants* (seventh edition 1915) is 1,202. Rea in his *British Benthomycetes* and his *Appendix thereto* (Trans. Bot. Myc. Soc. XII 1917) enumerates of Hymenomycetes and Gasteromycetes alone 1,612 species. This number would be more than doubled if to it were added all the other British Fungi included in the *Codices*, *Cod. agnati*, *Phycomycetes*, *Ascomycetes*, and *Fungi Imperfecti*.

perfect " forms in southern or warmer latitudes where special developments for survival of the winter are not necessary.

3. *The Fungi of Manitoba and of Southern Ontario.*—The mild peninsula of Ontario extending southward between the Great Lakes has a flora including many plants not found elsewhere in Canada. Its phanerogamic and cryptogamic floras resemble those of New York and Michigan. A larger number of species of fungi have been found in the counties around London, Ontario, than have been found in Manitoba, and a noticeable but not easily defined difference is evident between the conspicuous features of the fungus-floras of the two localities.

4. *General Observations upon the Distribution of the Fungi.* It is evident that many species of fungi are widely distributed over the world, and that many others are limited in their distribution because they can utilize only certain hosts or substrata. Thus the species of *Myxomycetes*, *Helvellales*, and *Pezizales*, which develop upon substrata of old wood or humus and usually are not restricted to specific phanerogamic remains and which are found in Manitoba are for the most part found also in Europe. The *Agaricaceae* occupy a somewhat intermediate position as regards distribution, because they frequently have a mycorrhizal or saprophytic relation to certain hosts. The *Sphaeriales* and *Sphaeropodales* and more particularly the parasitic groups such as the *Uredinales* and most of the known *Melanconiales* so far observed, are found to be more largely non-European because so many of their hosts are confined to North America.

Climatic factors, such as rainfall, humidity, temperature, and length of season, have an important effect

upon the prevalence or destructiveness of fungi. Thus the dry climate of Manitoba is doubtless responsible for the absence from the Province in most years of such moisture requiring *Petusicarpus* as *Phytophthora infestans* and *Pseudoperonospora Humuli*, and for the total absence of *Phytophthora Plasmii* and *Peronospora Schiederae*. It is certain that some thousands of European and Asiatic fungi have not crossed the ocean barriers which separate them from North America. Nevertheless, since the distribution of fungi in general is surprisingly cosmopolitan it is to be expected that sooner or later there will be found in Manitoba a considerable proportion of the fungi capable of developing upon the substrata present. The importance of the host relation factor is well shown in Manitoba as elsewhere, by the marked difference in the fungus-flora of two adjacent forests, one deciduous and the other coniferous.

Collections of plants, usually including some fungi, have been made by several of the exploratory expeditions sent to the Canadian arctic regions, but no specialist in mycology has ever collected there. One of us (J. D.) studied the fungus material brought back by the Canadian Arctic Expedition of 1913-1918 (17a). Part of the territory explored by the Expedition lies due north of Manitoba. Of the total of 142 species recorded for the Canadian arctic only 19 are named in both the Arctic list and that of Manitoba. The survey of the wide gap of nearly a thousand miles between the Arctic Circle and the portion of Manitoba over which we have collected will certainly yield interesting results.

IV

THE FUNGI OF PARTICULAR AREAS.

1. **Manitoba Agricultural College** is situated on the banks of the Red River nearly four miles south of the limits of the city of Winnipeg. The soil is a heavy clay loam resulting from sediments which were deposited at the bottom of the glacial Lake Agassiz and were subsequently overlaid by deposits left by inundations of the Red River. The surface is flat and, in very recent times—perhaps within the past century—has become covered with a young deciduous forest, except for a few shallow depressions in which water remains during the spring and precludes the growth of trees. The trees are predominantly poplar, but many ash, box-elder (*Acer Negundo*), oak, willow, and elm, and a few basswood (*Tilia americana*) are present and, here and there they displace the poplars. An underbrush of various shrubs and herbs is able to develop beneath the trees over most of the area. The leaf-mould on the soil is thin, and there is an absence of large rotting logs such as be on the ground in older and monster forests. The depressions or sloughs become filled with coarse grasses and sedges *Alisma Sagittaria*, etc., and the water dries up during the summer. The college plots are on land cleared from the woods. No conifers or birches occur in the native flora at M A C, nor are true prairie associations present. The collecting ground, therefore, is not an especially favourable

one. Nearly all the M A C fungi were collected within the south half of a circle having a half mile radius and its centre at the Biology Building. This semicircle includes the varied cultivated plants of the college plots, the partially cleared college woods to the eastward, and similar woods just south of the college grounds. A few collections marked "M A C" were obtained on similar terrain but slightly outside the semicircle. Within this limited territory, intensive surveys made throughout the year with the assistance of the staff of the Rust Research Laboratory, have resulted in the discovery of about 1,200 species of fungi (summary in Section XI). The Sphaeriales, Thelephoraceae, and Fungi Imperfecti have been studied carefully nowhere else in the Province. Many Myxomycetes, Pezizales, and Polyporaceae have been found here. The Rust that has escaped collection must be very scarce. The Agaricaceae are not especially abundant or diverse around M A C, but, because they could be carefully studied, the total number of species recorded is relatively large. The environs of the Manitoba Agricultural College constitute an area mycologically well but not exhaustively explored.

2. **Victoria Beach** is a peninsula formerly an island, extending into Lake Winnipeg 70 miles N N E. of Winnipeg. The soil varies from pure sand to a sandy loam. Coniferous trees predominate, particularly *Pinus Banksiana*, *Abies balsamea*, *Picea canadensis*, *P. mariana*, and *Juniperus*. Bitches and other deciduous trees are also common. The plant associations are *Pinus-Vaccinium* on the sand, *Abies-Picea* with no underbrush, mixed coniferous and deciduous woods, and marsh plants. Victoria Beach is an excellent collecting ground and it has been visited

more than twenty times. The abundant flora of agarics has occupied much of our attention, but the other Basidiomycetes, as well as the Myxomycetes and Discomycetes, have also been sought. Victoria Beach, which is easily reached by rail from the end of May until early September, is representative of much of eastern Manitoba.

3. Norway House has been described in another publication (25). It is a highly interesting area, similar in topography to Minaki and Kenora but 300 miles farther north. During a visit made by one of us (G. R. B.) in 1923, the Agaricaceae were present in great profusion, but there were no facilities for determining them. Another visit was made of a week's duration, Aug. 22-29, 1928, with preparations to study them, but they were very scarce because the summer had been extremely dry. As a result of the two expeditions, about 160 species of fungi were collected, several of which have not been found elsewhere in the Province. It is here, so far as we know, that *Puccinia gigantea* reaches its most easterly station. Practically half the species of *Puccinia* found are short-cycled. An exhaustive survey of the fungus flora of the district would yield many valuable data on the distribution of fungi. The opening up of northern Manitoba will provide further opportunities for examining the mycologically unknown areas north of the 54th parallel.

4. Minaki and Kenora are on northern bays of the very irregular Lake of the Woods. Here the pre-Cambrian rock is exposed, or lightly covered with soil. The plant associations are much the same as at Victoria Beach and are representative of eastern Manitoba. In late September or early October every

year since 1924, a week end foray has been held at either Minaki or Kenora, during which from three to twelve persons have collected fungi and studied the species found. Many other visits to these places, especially Kenora, have been made in the late autumn by A. H. R. B. The Agaricaceae at both Minaki and Kenora are very abundant, but many other groups are represented in the collections. In the tabulated summary given in Section XI "Lake of the Woods" includes Ingolf and Indian Bay as well as Minaki and Kenora. When the last two places are cited for the distribution of a fungus it will be understood that it is almost always a collection made about the end of September, i. e. near the close of the collecting season. Ingolf collections were nearly all made in August by W. M. Denker. Indian Bay is in Manitoba on a more southern part of the Lake of the Woods. All of the collecting grounds on the Lake are beautiful and rich in material for the mycologist and, although Minaki and Kenora are situated in Ontario, there can be little doubt that every species found there has a range which extends into Manitoba.

4. *Western Manitoba*, particularly as regards its dry prairies such as those around Brandon, Carberry, and southward, offers an attractive field for the student of fungi. Professor W. P. Fraser has found many nests there. The authors have had little opportunity to collect the other parasitic fungi occurring on these western prairies, but such excursions as have been made have been very productive.

V.

IMMIGRATION AND ECOLOGY

1. **Immigration.**—It has been remarked already that the fungi in the region surveyed must all have arrived during the few thousand years which have elapsed since the glacial Period came to a close. Some of the species may have come in with their vascular hosts and others by spores transported by air-currents and other agencies. The fungus flora is not static for the immigration of new species is still in progress. As examples of fungi which have come into Manitoba apparently within the last decade may be mentioned *Plasmopara viticola*, *Phytophthora infestans*, *Sphaerotheca mors urae*, *Uromyces Cepulae*, *Puccinia Sorgho*, *Puccinia Antirrhini*, *Puccinia anomala*, and *Uromyces Trifolii* (33). It is possible, of course that certain of these species may have been present somewhat longer, or that some may have been re-introductions which were present at some previous time and, temporarily, had disappeared from the Province. Thus *Phytophthora infestans* may have occurred in preceding damp periods, but its prevalence in 1927 and 1928 was doubtless due to re-introduction.

All of the fungi just mentioned attack cultivated plants which have been grown in Manitoba for no more than a century and, for the most part, during a much shorter period. Man through his transportation agencies, has brought in some of them, and he will

continue to introduce fungi, especially those parasites upon economic plants. This survey will aid in the detection of future introductions.

Saprophytes and parasites of native plants are also undoubtedly still arriving in Manitoba. A number of Peronosporales which were first found in 1926 are indicated by this date in the List of Fungi, but one cannot be sure that they were not here earlier. Fungi not infrequently are found where they had not occurred in previous years. Thus *Botrytis spharorhporus* first appeared in 1926 and was rather common in 1927 in an area at the Manitoba Agricultural College which had been carefully examined in each of the preceding six years. It may have been a new arrival, but, more probably it was an old inhabitant which found conditions propitious for fruiting in 1926 and 1927. It should be recorded that it was not found in 1928. Speculations regarding the time of arrival of fungi, excepting certain parasites of crop plants may lead one far astray. For instances are known of the long persistence of mycelium whose fruitings have been separated by intervals of many years.

2. **The Effect of the Manitoba Winter.** During the four or five winter months the temperature in Manitoba is below the freezing point except for occasional days and, on the average is below zero Fahrenheit for several weeks. Winter conditions although they affect the growth and development of the fungi do not seem to make any difference in the abundance of the fungi when the growing season returns.

Some of the Agaricaceae are not infrequently precluded from autumn development because of the early onset of winter in which case they may appear during the following spring, e.g. *Cortinarius macylane* and

Psalliota campestris. On the other hand, the retardation induced by winter so checks many fungi that they do not appear until late in the summer. Spring, however, regularly brings its crop of such fungi as *Morchella*, certain *Pezizales*, and the mature stage of many *Pyrenomyces*. Because the Barberry is absent, the cycle of the wheat rust, *Puccinia graminis* (except the race *P. graminis pili-proferens*) is broken with the death of the urediniospores during the winter. The annual recurrence of wheat rust starts from spores borne by southern winds from the United States. This important statement has been proved by numerous experiments made in western Canada by W. P. Fraser who studied the loss of vitality of the urediniospores and by the staff at the Rust Research Laboratory who collected air-borne rust spores on slides exposed from aeroplanes and stationary objects. Other species of rusts and some other fungi may perhaps migrate in a similar manner. Uredinales that can carry on from season to season by their summer spores in warmer latitudes may survive the winter in Manitoba by producing well protected teliospores. *Plasmopara viticola*, which attacked cultivated grapes seriously at Morden and M.A.C. in 1927, could not be found in 1928 and, evidently, it had been killed during the winter.

Doubtless the rigours of winter may account for the absence of certain fungi from Manitoba, or perhaps some of those found may have been merely transient visitors arriving now and then for a summer only, but obviously most Manitoban fungi do not find the winters fatal. Species of *Fomes* are perennial; others, such as *Polyporus betulinus* and *Collybia velutipes*, may develop as winter annuals. That the cold of winter

cannot injure such a fungus as *Nectriaophylisma* is demonstrated by the experiments of one of us (A. H. R. B.), who subjected fruit bodies to the temperature of liquid air for three weeks, and found them to be still viable (38). Such fungi are capable of surviving long periods of desiccation such as occur in winter. *Strobilales saurobor* in the dry condition kept its vitality in the dark at room temperatures for over eight years (49).

2. Fungi developing upon other Fungi in Manitoba.

Several species are actively parasitic upon fungi. Examples are *Piptocerphalus* on *Mucora*, *Coccinobolus* on *Erysiphe*, *Darlara* on *Uredineae*, *Sphaeromella* on *Helvella*, *Scuticotrachium* on *Clavariae*, and *Hypomyces lactifluorum* Peckiaella, and *Mycogone* on various *Agaricaceae* especially *Lactaria* and *Rosulaceae*.

Other species are less actively parasitic or only saprophytic upon the fungi. *Chaetocladium* is sometimes parasitic upon *Mucora*. *Sphaeriales* such as *Diatrype*, *Hypoxyton*, *Massaria* and *Valsa* may bear *Nectria epiphyserna*, *Hypocrea patella* and *Calomastrix Dearnessii*. *Polypori* and *Fomes* may support *Badhamia intricularis*, *Hypomyces aurantius*, *H. rosellus*, *Hypocrea citrina*, *H. pallida*, *Melanconpora lagenaria*, and *Eleutheromyces subulatus*. *Agaricaceae* and *Boleti* frequently become overgrown with *Sepedonium chrysospermum*, *Chiodosporium epimyces*, *Nyctegites*, *Aspergillus*, *Hypomyces rosellus*, and occasionally with *Eleutheromyces*.

Lichens in Manitoba are sometimes found upon old woody fungi, but apparently, they have no specific relations with them except in the case of *Calicium polyporum* which frequently occurs on *Polyporus porporeus* and other than *Polypori*. Conversely, a

number of fungi are known to be parasitic upon lichens, although only *Illosporium rostrum* and a species of *Sporotrichum* have been observed upon them. The fungus parasites of the Algae, the Mosses, and the Hepatics have not yet been studied.

4. **The Fungi attacking Insects and other Small Animals.**—Some of the insects attacking crop plants may be held in check to a greater or lesser degree by parasitic fungi. *Entomophthora Grylli* kills grasshoppers, especially when the latter become abundant. House-flies become infected in autumn by *Empusa Muscorum*, and aphids may be decimated by *Empusa Aphidis*. Cutworms are sometimes killed by *Entomophthora variegata* or *Toxichium megaspermaum*. White grubs are occasionally affected with *Cordyceps militaris*, and *C. clavulata* has been seen on *Locusts*. Young chickens are sometimes killed by *Aspergillus fumigatus*.

VI.

COPROPHILOUS FUNGI

A characteristic and highly interesting fungus-flora, as is well known, develops upon the dung of animals. The mechanisms by which many of these organisms produce and liberate their spores in such a way as to perpetuate the species on their peculiar substratum have been carefully studied by one of us, and many of his observations have been, or will be, recorded in the volumes of his *Researches on Fungi* (35). Coprophilous fungi, doubtless, have a very wide distribution. Ninety three species of them have been collected in Manitoba.

Of those Myxomycetes which are known to be *Stenoculous*, at least facultatively, several are present in Manitoba. *Didymium difforme* has been found only upon horse dung. *D. uccinum* has been found but once on cow dung. *D. squamulosum* and *Craterium leucocephalum* sometimes occur upon horse dung and *Licium fuscicola* is known only on this substratum. Several Myxobacteriaceae are coprophilous, but the only one identified is *Chondromyces crocatus* which is common on wet horse dung or upon the decaying stipes of small *Coprus*, often in such abundance as to give the substrata a sprinkled, crocus yellow colour. *Dictyodictyon marcorodes*, of the *Actinaeae*, is not uncommon on horse dung. No effort has been made to determine the numerous bacteria occurring upon dung.

In the Mucorales ten simicolous species have been identified, including a *Piptocephalus* which is frequently a parasite on *Mucor mucedo*, etc. A species of *Syncephalus* sometimes parasitizes *Pilobolus*. Several genera of Ascomycetes are commonly or entirely inhabitants of dung. Two species of *Ascobolus*, three of *Ascophanus*, *Lanobolus equinus*, two species of *Patella*, *Peziza vesiculosa*, *Pyrenopeziza canina*, three species of *Rhyparobius*, and *Saccobolus depauperatus* are listed as coprophilous *Pezizales* and *Gymnascus Russii* as a coprophilous species of *Aspergillales*. The *Chaetomiaceae* and *Sordariaceae*, of which twenty-five species have been found, are predominantly simicolous. No other member of the *Sphaeriales* has been observed upon dung in Manitoba.

The coprophilous *Basidiomycetes* given in the List of Species are all *Agaricaceae*, excepting *Cyathus stercoreus* and *Sphaerobolus stellatus* and they include two species of *Bolbitis*, one each of *Galera*, *Pileolus*, *Pulchrybe*, and *Anellaria*, three of *Stropharia*, seventeen of *Coprinus*, three of *Parasolus*, and sometimes *Panholia campestris*. None of these has white or pink spores. Among the numerous coprophilous *Fungi Imperfecti* the only identifications are one species each of *Aspergillus*, *Botrytis*, *Curemum*, and *Graphium*.

When fresh dung has been brought into the laboratory and placed in a damp chamber a succession of fungi always appears upon it and this succession is influenced by the kind of dung, the moisture, and the temperature. The task of identifying the fungi is simplified as one becomes familiar with their time of occurrence. Many observations have been made at Winnipeg on the succession of fungi upon horse dung. Usually the dung was collected in the winter in a frozen

condition, i.e. under conditions which practically precluded its extraneous inoculation by spores or mycelium. When such material was placed under a bell jar in diffuse light at room temperature, and moistened only when the danger of drying became imminent the succession of fungi was as follows:

First and second day, certain bacteria but no obvious development of fungi. On the third day, *Pilobolus*, usually *P. longipes* generally appeared in profusion. From about the fourth to the seventh day a profuse white overgrowth of *Mucor racemosus* and *M. Mucedo* appeared sometimes as soon as to overwhelm many of the *Piloboli*. The *Mucori* at once proceeded to develop sporangia, their mycelium then became attacked by *Pythocephalus* and *Chariclocladium* and the cycle was completed with their inconspicuous remains left upon the substratum. About the ninth day *Fusiclaria fusicola*, the first *Pyrenomycete* appeared and it was usually abundant for several days. At this time certain *Mucorales* such as *Syncephalus*, *Pilobolus crystallinus* and *P. Kleinii* were observed. On the tenth day, usually *Coprinus curius*, the first agaric-began to push up its fruit bodies.

During the second fortnight *Coprinus lagopus* and *C. ephemerus* are almost certain to be present as early followers of *C. curius*. Simultaneously *Laricobolus equinus* appears and *Ascobotus mucronatus* becomes mature. *Ascobotus mucronatus* and *Ascophanus* may develop during this period or later and, usually in damp parts, *Chondromyces cruentus* and other *Myxobacteriaceae*. *Pleurogea desipens* often matures about the sixteenth day and thereafter a number of other species of *Pleurogea* are likely to be present for weeks or months. *Pleurogea oaxensis*, *P. incusoides*, and *P. minima* have been observed along with *Sporormia minima* about the

eighteenth day *Sporormia intermedia* and *Panasotus campenotus* are frequently found before the end of a month. *Phycomyces blakesleeanus* rarely develops.

After a month certain fungi appear for the first time. *Coprinus stercoreus* may now develop. If it does, it so covers the substratum with mycelium as to swamp other fungi. If it does not appear there may come up in its place species of *Didymium*, *Saccobolus*, and *Graphium*. *Pleuroge albicans*, *P. conica* and other species of *Pleuroge* whose time factor has not been critically observed. *Delicatula sanguis* has been found only after the culture had become several weeks old. *Fusaria vasculosa* (*Coprinus Hendersonii*), *C. longipes* and *Galera bulbifera* appear only in old cultures. *Auillaria separata*, *Panasotus solidipes* and *Stropharia eremoglobata* have occasionally been observed.

Psallida campestris, *Clathrus stercorarius*, and *Sphaerobolus stellatus* have not been seen in these cultures kept from the beginning in the laboratory.

If the horse dung be kept wet, sclerotia of *Coprinus stercorarius* usually develop at its surface after about three weeks and, if left undisturbed upon the dung, they may without having dried up, produce fruit-bodies a few weeks later. *C. narretius* also appears on the wet substratum, but rarely. It has been seen only three times. Mycobacteria and bacteria are more abundant but many of the fungi which appear on dryer dung now fail to develop.

Dung of our goat rabbit, etc. show successions of fungi differing in many respects from that on horse dung but the data for such successions are at present incomplete and will not be recorded here. It should be mentioned that the animal referred to as "rabbit" in Manitoba is really the Varying Hare, *Lepus americanus phaeonotus*.

VII.

NEW SPECIES.

The following species are described as new in this publication, the authors being Dearness and Baby unless otherwise stated

- Licea fimicola*
- Pyrenoma canina*
- Stictis curtispora*
- Dichasna Populi*
- Graphylinum manitobiense*
- Halbanella Luntacea* Dearn
- Curveyella Bushyi* Dearn
- Ceriospora manitobiensis*
- Didymella manitobensis*
- Leptosphaeria rugosa*
- Metasphaeria querna*
- Pyrenophora rugosa*
- Diaporthe Viburni*
- Diatrype Celastri*
- Sporobolomyces albus* Hanna
- Hypochnus flavo-brunneus*
- Hypholoma longipes*
- Coprinus longipes* Buller
- parvisporus* Buller
- *stellatus* Buller
- Cerocephoria Lappulae*
- Cerocephorella Gai*
- *Nesliae*

Ramularia coccinea

—— **sepinum**

Scopularia Populi

Trichosporium parasiticum

Colletotrichum Humuli Dearn

Gloeosporium spadiceum

Marssonia Aquilegiae Dearn

Heteropateila Viburni

Phyllosticta Corni-canadensis

Rhabdospora Viburni-Opuli

Septoria Giliae

Two new varieties are also included here *Gnomonia Coryli* var. *circinata*, and *Pleurotus atrocaryulens* var. *minimus*.

From the collections we have made in Manitoba, the following species have previously been described as new

Didymophaeria manitobensis E. & E.

Corticium septentrionale Burt

Pennophora odontoides Burt

Ptychogaster subcuculoides Lloyd

Ceroaspora manitobana Davis

Phyllosticta Draccephala Dearn & Busby

Cylindrosporiella sibiricum Dearn & Busby

Marssonia Souchei Dearn & Busby

Septoria Souchei-arvensis Dearn & Busby

Stagonospora Amorphae Dearn & Busby

Septogloeum rhopaloides Dearn & Busby

The 45 new species and 2 new varieties found in collecting about 1,250 species indicate that the fungi of North America are still imperfectly known, rather than that the mycological flora of Manitoba is peculiar

VIII.

RARE SPECIES.

Although the new species listed in Section VII might be supposed the rarest, they are not always so, for some of them are common in Manitoba and probably elsewhere, and their existence hitherto had merely escaped notice. A number of species usually considered rare in other parts of North America are fairly abundant in Manitoba. "It seems to me," wrote Dr F J Beaver, Aug 2, 1928, "that a great many interesting species are collected up there which are not frequently found in other places. . . it may be because the collecting is more intensive." No doubt careful surveying counts for much but environmental factors seem to be needed in any attempt to explain why such species as *Polyporus caninus*, *Clavaria Patouillardii*, *Claudopus mephitisus*, *Trepidothis cinnabarinus*, *Helvella sphaerospora*, *Ascobolus strussporus*, *Plectania hiemalis* (*Sarcocypha protracta*), and *Polyporus tuberaster*, rare or unknown in many areas in North America are more or less common in Manitoba. On the other hand, many species common in more southern or eastern parts of North America are, for no obvious reason, rare in the Province, e.g. *Polyporus sulphureus*, *Urocystis Cepulae*, *Puccinia anomala*, *Gibberella Saubinetii*, *Diplodia Zeae*. Some species such as *Physarum rubiginosum*, *Pseudoperonospora Humuli*, *Uromyces columbaris*, *Polyporus albiceps*, *Pleurotus subpalmatus*, *Cortinarius co-*

laccus are not only rare in Manitoba but rare throughout North America.

A few European species not previously known in North America are here recorded apparently for the first time, e.g. *Delitichia insignis*, *Eutyloma Achilleae*, *Coprinus Rostrupianus*, *Hygrophorus nigrescens*, and *Harposporium Anguillulae*.

Certain fungi may be considered rare that are readily found when their habitat is known. Thus the sclerotium-producing *Coprinus Rostrupianus*, previously recorded with certainty only by Hansen in Denmark, has been easily found in old cow dung pats in Manitoba every year since 1923 when the authors first discovered it there.

In closing this Section, it may be of interest to mention that *Fomes fomentarius*, which has a European range but appears to be absent from England¹ and is very rare in the north of Scotland, is one of the commonest polypores in Manitoba where it causes the destruction of a great many birches (*Betula papyrifera*).

¹ Miss E. M. Wakefield of the Kew Herbarium has informed the writers that the statement made in British fungus-books, namely, that *Fomes fomentarius* is common in England, is based on a misinterpretation of the species which was due to a misleading citation by Fræs.

IX.

FUNGI APPARENTLY ABSENT

Many fungi are absent because their hosts do not grow in Manitoba. others, common in Europe, have not reached North America. but for the absence of still others no explanation is apparent. *Scleroderma aurantium* (8. *vilgare*) not yet found in the Province, is said by Coker and Couch (11) to be northern in range in North America and to grow in either deciduous or coniferous woods. *Plectania coccinea*, whose bright red cups are conspicuous in the spring in Minnesota, is inexplicably absent from the observed range. *Puccinia saxatilis* has not been found, despite much search, although it occurs in the adjoining States of the U.S.A. and its host is a common weed. *Puccinia plumarum*, which is common in western North America, has never yet invaded the wheat-fields of Manitoba. There is no Manitoban record of *Collybia radicata* which is common in eastern Ontario, nor of the showy and edible *Amanita caesarea* and *A. ruberens*. *Fulvula hepatica* so well known in Europe and parts of North America, has never been found on *Quercus macrocarpa* (the only oak in Manitoba) or on any other tree.

The absence from Manitoba of certain fungi e.g. *Collybia fusipes*, whose clustered fruit bodies are so often seen over the roots of beeches and oaks in Europe, and of *Coprinus praecox*, one of the most striking of

the European *Coprinus*, is not surprising, since such experienced mycologists as Atkinson, Kanffman, and Murrid have never found these species in North America.

Doubtless a more complete knowledge of the relation of various fungi to the pteridogamas with which they are associated would help to explain why the authors have not found some of the fungi for which they have sought.

X

ESTIMATES OF THE TOTAL NUMBER OF SPECIES OF FUNGI IN MANITOBA

Including 64 species of micro-fungi as yet not satisfactorily determined, over 1,000 species have been collected in the area surveyed. The fungus flora of Manitoba may be compared with that of north central Europe which, mycologically, is thoroughly known. In the nine volumes of Rabenhorst's *Kryptogamen Flora* which treat of north central Europe nearly 15,000 species of fungi are described, of which about 8,400 are Imperfecti and therefore, in a good many instances merely stages of mature forms described under other names. On the other hand, this territory has yielded and is still yielding many additional species since Rabenhorst published his work, and a total of 15,000 actual species may yet be found within its boundaries. Manitoba has less diversity of soil and situation, fewer indigenous and introduced phanerogams to serve as hosts, less rainfall, and colder winters than the corresponding region in north central Europe, all of these factors tending to reduce the number and variety of its fungi. Yet it seems conservative to estimate the number of fungi in Manitoba at one half that of north central Europe, i.e. very roughly at about 7,500.

Our collecting records show 540 species at the close of 1922, additions during 1923, 150 species, 1924,

160 species, 1925, 240 species, 1926, 240 species; 1927, 280 species, 1928, 367 species. The ascending curve of numbers is due to increased experience in collecting, wider knowledge of the territory, and more workers, but, notwithstanding these advantages, it could not continue rising with increased rapidity unless a vast number of species still remained undiscovered.

Comparison between the fungus flora of Manitoba and that of North Dakota (an adjoining State of the U.S.A.) may be made with the help of data published by Dr. J. F. Brondie in *Mycologia* (Vol. IX, p. 273, and Vol. X, p. 199). He gives as a "random sample" of the North Dakotan Ascomycetes, 267 species, while a similar "random sample," taken in Manitoba and including species collected up to the spring of 1928, was 238 species, of which only 75 were common to both lists. Assuming that the fungus floras of Manitoba and of North Dakota are identical, a simple biometrical calculation indicates that the total number of Ascomycetes present in the two areas combined is 267×238

75 or, roughly 850. But, if all the Asco-

mycetes of Manitoba, i.e. 415 be compared with the 267 in the "random sample" from North Dakota, only about 100 are common, in which case the total number of Ascomycetes in the two areas combined is, by calculation about 1,100. These figures, although highly speculative, point to the conclusion that the number of species of fungi in Manitoba must be far greater and probably more than double, the recorded number.

XI.

STATISTICAL SUMMARY

Summary of the Total Number of Species and Varieties recorded, and the Number found in Certain Areas discussed in Section IV.

Group	M. & C.	Victoria Beach	Norway House	Lake of the Woods	Total in Manitoba
Myxomycetes	55	24	3	8	79
Bacteria	17	0	2	0	23
Phycomycetes					
Oomycos	20	2	1	2	30
Zygomycetes	14	2	1	0	18
Ascomycetes					
Lower orders	3	1	0	0	4
Helvellaceae	3	12	1	11	18
Pezizales	76	33	5	25	141
Phacidiales	11	3	2	4	16
Hysteriales	5	0	4	2	12
Tuberciales	0	0	0	0	1
Aspergillales	1	0	0	1	4
Pezizociales	19	11	4	9	34
Hypochoeriales	18	8	3	7	24
Dothidiales	4	2	1	1	6
Sphaeriales	70	13	8	12	104
Laboulbeniales	0	0	0	0	1
Basidiomycetes					
Sporobolomyces	2	0	0	0	2
Ustilaginates	22	4	4	3	38
Uredinales	63	24	28	25	134
Other lower orders	11	0	4	10	20
Telephoraceae	53	12	17	17	81
Clavariaceae	11	7	4	10	33

Group	M. A. C.	Victoria Island	Norway Island	Lake of the Woods	Total to Manitoba
Basidiomycetes—cont					
Hydnaceae	12	8	4	12	36
Polyporaceae	62	38	19	38	98
Boletaceae	4	6	1	10	14
Agaricaceae	250	222	19	182	493
Remaining orders	19	7	4	14	37
Fungi Imperfecti					
Hyphomycetes	113	10	12	16	173
Melanosporales	29	3	3	4	49
Sphaeropodales	150	11	6	17	213
Totals	1,207	480	100	438	1,969
Fungi parasitic on man, etc (side end of Section XIV)					20
Lichens (side Section X)					90
Grand total					2,079

From the Table it may be seen that the total number of species in each of the main groups is as follows. Myxomycetes, 79 Bacteria, 23 Phycomycetes, 48, Ascomycetes, 415, Basidiomycetes, 969, Fungi Imperfecti, 436, Fungi parasitic on man, 20, and Lichens, 90, making a grand total of 2,079. If from this grand total there be subtracted the varieties of species and a few entries of Ascomycetes duplicated in the list of Fungi Imperfecti, there remains a total of about 2,000 definite species found in Manitoba.

XII.

HISTORY OF OBSERVATIONS ON THE FUNGI OF MANITOBA

During the nineteenth century, prior to its last decade, several naturalists including the late Dr John Macoun visited Manitoba, but, so far as is known, none of them paid any attention to the fungi there. However, Macoun collected lichens, and his records published in his *Catalogue of Canadian Plants* have been combined with our own in section XV.

The first observations on the fungi of Manitoba were made by one of us (J. D.) who visited the Province in 1891. He then saw *Puccinia graminis* the destructive cereal rust,¹ and in late September and early October, along the Little Saskatchewan River (now the Minnedosa River) he collected rusts of sedges and wild roses as well as many specimens of *Didymosphaeria manitobensis*. The *Didymosphaeria* was a new species which was named by Ellis and Everhart (7) and distributed by them in their *Errata of North American Fungi* as No. 2761. Ellis and Everhart's description of this species appears to be the earliest printed record of a Manitoban fungus. Of two other fungi collected by

¹ Another of the authors (A. H. R. B.) found *Puccinia graminis* abundantly present on wheat in 1904, at which time the Winnipeg Grain Exchange began to take notice of its ravages. It is only since 1914 that the serious losses which it causes to the wheat-growing industry have been generally recognized.

the same author in 1881, namely, *Trametes carnea* and *Phragmidium Potentillae* portions are now in the Manitoba Agricultural College herbarium.

A. H. R. Bulter came to Manitoba in 1904, and he has studied the fungi every autumn and winter since that time. His publications are listed in the Bibliography. The three Criddle brothers have long been interested in the natural history of the area about Treebank. Mr. Norman Criddle as early as 1906 (52) published some observations on the eating of *Amannia muscaria* by cattle, and he has made a number of excellent coloured drawings of the larger fungi, which will be valuable in subsequent studies of the mycology of the Treebank district. Mr. Evelyn Criddle, during the past few years, has collected the rusts there, and his findings include certain species which no one else has collected in Manitoba. Mr. Stuart Criddle sent to the authors a number of fungi stored by squirrels in their nests (41), and he has grown *Polyporus tuberaster* from its sclerotium.

Mr. W. N. Cheesman (51) in company with A. H. R. B., collected several fungi in Manitoba in 1909. Professor V. W. Jackson, who has been at the Agricultural College since 1913, has rendered valuable assistance, especially in the determination of hosts, and, with J. F. Higham and H. Groh, has made a list of the flowering plants and ferns of Manitoba (20). Professor W. P. Fraser spent the years 1917 and 1918 at Brandon, where he collected and cultured a number of Manitoban rusts. Since that time he has continued his studies upon the rusts of the Prairie Provinces at the University of Saskatchewan (54-57).

Mr. I. L. Connors and G. R. Buby arrived at Winnipeg in 1920 and since that time have studied the fungi

an opportunity offered. Mr Connors worked at Brandon during 1923 and 1924. Dr. D. L. Bailey came to M.A.C. in 1923 to direct the work of the Dominion Rust Research Laboratory. The staff of this institution now includes Mr J. H. Craigie in charge, Dr. Margaret Newton, Messrs. Goulden, Hanna, Gordon, Connors, Johnson, Welch, Neathy, Greaney, Popp, Brown, and Petersen, each of whom has made useful contributions to our knowledge of Manitoban fungi, more especially those causing cereal diseases. The publications of the mycological workers in Manitoba are all included in the Bibliography.

XIII

THE GROUPS OF FUNGI AND ACKNOWLEDGMENTS FOR ASSISTANCE IN DETERMINING SPECIES.

To avoid interpolations in the next Section, some observations on the classes, orders, families, or genera of the fungi included in the list of species will now be made.

The *Mixomycetes* (*Myxozoa*) are moderately abundant in Manitoba, in spite of the apparently unfavourable environment. Dr W. T. Ellert of England has critically examined material of most of the species. Lack of space prevented the inclusion of his many valuable notes which are filed with the specimens to which they respectively relate. Miss Guheima Lister kindly examined several collections. Among the species found are a number that are rare and one that is new and here described for the first time.

On account of their peculiar life history and remarkable variety and beauty of form, the *Mixomycetes* for the biologist and microscopist are a very attractive group and, on this account they have received the attention of a number of Canadian workers. Among the Canadian lists of species are the following: Moore's for Pictou, Nova Scotia, Eastham's for Ottawa, Dearness' for Middlesex (17), Adamstone's for Lake Nipigon (15), Chessman's for the Canadian Rockies (51), and Currie's for Ontario, the longest list of all (16).

The following Manitoban species of Myxomycetes were not included by Miss Currie in the 107 species and 10 varieties which she listed as present in Ontario

<i>Arcyria insignis</i>	<i>Physarum conatum</i>
<i>A. occidentalis</i>	<i>P. didermoides</i>
<i>A. incarnata</i> var. <i>fulgens</i>	<i>P. leucocephalum</i>
<i>Badhamia decipiens</i>	<i>P. maydis</i>
<i>B. panicea</i>	<i>P. mutabile</i>
<i>Diderma radiatum</i>	<i>P. nutans robustum</i>
<i>Didymium difforme</i>	<i>P. rubiginosum</i>
<i>D. vaccinum</i>	<i>P. viride ananum</i>
<i>Fuligo septizon candida</i>	<i>Stereonitis hyperopta</i>
<i>Lamproderma columbi-</i> <i>num</i>	<i>Trichia subfusca</i>
<i>L. scintillans</i>	<i>T. contorta inconspicua</i>
<i>Oligonema nitens</i>	<i>Tubifera casparyi</i>
<i>Perichaena depressa</i>	<i>Lacca fimicola</i>
<i>Physarella oblonga</i>	

Of the 22 species and 3 varieties just listed 16 species and all the varieties at present are only known in Canada from Manitoba. Other Canadian species not found by Miss Currie or the authors are *Lacca variabilis* reported from Ontario and Nova Scotia, *Margarita metallica* and recently *Enerthenema Berkeleyanum* (18) from Nova Scotia, and *Lacca biforis* and *Lachnobolus ? congestus* from Ontario. Thus the total number of Myxomycetes recorded for Canada is 134 species and 15 varieties.

Lake Nipigon is in Ontario, not far from Manitoba's eastern boundary. Of the 29 forms found in the Lake Nipigon district (15) 6 have not yet been seen in Manitoba. Doubtless, when the whole Province of Manitoba has been adequately surveyed, the total

number of Myxomycetes found within its borders, which is now 79 will be considerably augmented.

So far the authors have identified only one species in each of the following three groups: Myxobacteriaceae, Acrasieae and Plasmodiophoraceae. No member of the Plasmodiophoraceae has yet been found parasitic upon any crop plant in Manitoba.

In the list of bacteria parasitic upon economic plants the nomenclature used by Stevens has been followed (4). The bacterial diseases of native plants have not yet been studied. The most serious bacterial diseases of plants in Manitoba are those of the cereals, the fire blight of apples, bean blight, black-leg of potatoes, and soft rot of vegetables.

The Phycomycetes are not abundant in Manitoba, presumably because the climate is too dry. During wet seasons, however and especially when two or more such seasons follow in succession, they develop to a moderate extent. Baby and Connors (33) have recorded certain Peronosporaceae which were found for the first time in the wet season of 1927. During 1928, another wet season, these downy mildews and some others were even more prevalent. Species found only in 1928 are so indicated in the list. Except the fungus which causes late blight of potatoes, which was injurious in 1928, none of the Phycomycetes has been found to cause much damage to crops. There are many Saprolegniales in the numerous lakes and streams of Manitoba, but they have not yet been critically examined. The commoner Zygomycetes are present and occupy their usual substrata. Some of the Entomophthorales are economically important because they attack injurious insects such as flies, grasshoppers, and caterpillars.

The Ascomycetes, in Manitoba as elsewhere, are abundant. The authors have had the help of Dr F J Scaver of New York with a number of Discomycetes, and of Dr J F Brackley of Northville South Dakota, with a few of the Pyrenomycetes, but one of the authors (J D) has done the greater part of the work of identifying the species.

No attempt has been made to work out the Saccharomycetales. Two species of *Sporobolomyces* were collected at Winnipeg by Dr W F Hanna. Since their mode of spore discharge indicates that they belong to the Basidiomycetes, we have placed them there. The forthcoming Volume V of *Researches on Fungi* by A H R Buller will present the arguments for this decision. Species of *Sporobolomyces* are doubtless common.

Few Protomycetales or Protothecales appear to be indigenous in Manitoba. The Discomycetes, however, are well represented and include a number of rare or noteworthy species. The Phacidiales make a fairly good showing in the list, but the Hysteriales, although carefully sought, have proved to be rather scarce. In spite of much search, *Tuber separans*, identified by Dr Helen Gilkey, was the only member of the Tuberales discovered. The Penicilliales are represented by most of the powdery mildews for which suitable hosts are present in the Province. A number of interesting Hypocreales also occur, but only a few Dothidiales.

The Sphaeriales constitute a very large and attractive order, although many of its genera and species are obscure and difficult to determine. Some of the species are parasitic throughout their life-history, while many others are severely parasitic in their

youthful stage or stages but merely saprophytic in their mature stage. In relatively few cases has the connection between these stages been determined but, where it is known, it has been recorded in the lists of the Fungi Imperfecti. The number of species of Sphaeriales is so large that they have been arranged in families.

The insects of Manitoba are only now being scrutinized for Laboulbeniales, and, up to the present, of these fungi whose peculiar forms have been so beautifully illustrated by Dr Thaxter only one species has been found.

The Basidiomycetes are abundantly represented in Manitoba. Sporobolomyces, as already intimated, includes reduced forms, and it occupies a position corresponding to that of the Saccharomycetales among the Ascomycetes. The Ustilaginales are represented by most of the important smuts of cereals and by certain less common smuts of wild hosts. Professor H. S. Jackson, now of the University of Toronto, has verified a few of them as well as some of the rusts.

The list of Manitoban Uredinales is fairly complete. In this group the authors are much indebted to Professor W. P. Fraser, I. L. Connors, W. L. Gordon, and others named elsewhere. Professor Fraser examined several of the collections and, in some instances, supplied the entire record. Dr J. C. Arthur of Purdue University also assisted in some of the determinations. Mr Evelyn Criddle of Treewbank, during the past five or six years, has made a number of interesting collections which he has submitted to Professor Fraser. In 1925 Messrs Fraser and Connors published a useful paper on the rusts of the Prairie Provinces which should be consulted for data on the distribution of the group.

(57). Several species not then recorded for Manitoba will be found in the list of Uredinales given in Section XIV. The Host Index gives the complete list of species upon which rusts have been found in the Province. The familiar generic names *Puccinia* and *Uromyces* have been retained, otherwise, the nomenclature of the *North American Flora* has been followed.

The *Thelopharaceae* are well represented. The determination of the species is difficult, and for assistance the authors are indebted to Miss E. M. Wakefield of Kew and particularly to Dr. E. A. Burt (13) who has cited a number of our species in his monograph of the family.

Twenty three species of the *Clavariaceae* have been listed, and in determining several of them Dr. W. C. Coker has given his aid. He and Dr. Beardslee, as well as Dr. Burt and the late C. G. Lloyd, have been consulted in respect to the identity of some of the *Hydnaceae*.

The list of pileate *Polyporaceae* may be considered to be fairly complete. The determination or verification of the great majority of the names is due to Dr. L. O. Overholts, and several species were identified by Dr. J. R. Weir.

The *Bolotaceae* are better represented in wooded areas in Manitoba than the list indicates. Their soft tissues spoil so rapidly that it is difficult to keep them until a satisfactory determination can be made.

In the *Agaricaceae*, great numbers of individuals as well as species annually appear, particularly in eastern Manitoba and near the shores of Lake Winnipeg. Since the time of Fries it has been known that northern coniferous areas are particularly favourable for the

development of these fungi and Manitoba is no exception to the rule. The prevalence of agarics may vary markedly from year to year—for example, they were exceedingly abundant at Norway House in 1923 but, because of the dry summer in that region, very scarce during the corresponding season in 1924. Sometimes a cool wet autumn followed by an early winter prevents the development of certain species in the autumn, and then these species may appear in the following spring. The Winnipeg daily press commented several times in May and June 1927, upon the early spring crop of "mushrooms." The drier prairies and deciduous woods of western Manitoba and the more promising conifer covered hills in the west have not yet been surveyed.

The great majority of the Agaricaceae like the Boleti, are subject to early infestation and destruction by insects, and in warm weather the undried tissues soon putrefy. Dried agarics are difficult to determine with certainty for which reason the authors resident in Manitoba have had to make practically all of the determinations. One of them, A. H. R. Buller, has critically studied the mushrooms of the Winnipeg region for many years—indeed every season since 1904—and has found many of them identical with species that he knew in England and Germany. Some specimens have been submitted to Dr. C. H. Kauffman for his valued opinion, and his publications on this large group, dealing as they do with the agarics of almost adjacent territory, have been particularly helpful (1). Liberal use has been made of Gussow and Odell's finely illustrated book recently published at Ottawa (2). Uncertainty of determination is indicated in the list with an "(n)" and, as dried specimens are

preserved in the college herbarium corrections or confirmations of their names may yet be made.

The Amanitae except *Amanita muscaria*, are not abundant in Manitoba, and some of the species are represented only by a few plants collected in a single locality. *Amanita muscaria* is common in open woods in August and September. Its potency as an intoxicant in small doses and therefore as a poison in larger quantities has been demonstrated by personal experiment on two occasions. Few records of death from mushroom poisoning in Manitoba have been found but the Winnipeg evening papers of Aug. 5, 1921, contained a report of seven such deaths on an isolated farm not far from Dominion City. From the description of the case in the press we are led to suspect that the poisoning was due to *A. phalloides*, although no mycologist investigated the case. The newspaper account records that the "mushrooms" were gathered by the children on Sunday, and were cooked and eaten that day. On Monday one child died and apparently the other members of the family were too ill to call a physician. Another child died on Tuesday, the mother and another child on Wednesday, and two more children on Thursday, by which time neighbours arrived on the scene but the father, the last to succumb, could not be saved, and he was barely able to tell the story. Although *A. muscaria* is by far the commonest Amanita in Manitoba it would seem that a more toxic species must have been eaten.

Extended discussion of most of the other genera of the Agaricaceae is unnecessary. It will be noted by the mycologist who studies the List of Species that many species common elsewhere have not yet been seen in Manitoba. Their omission may be due to

insufficient study of the flora. It will also be noted that some species, e.g. *Collybia hygrophoroides* and *C. laetopus mephiticus* are recorded as common, although they are rare or unknown in other areas of North America. The Cortinari, as might be expected, are abundant, and many species of *Inocybe* are present. Critical observations on the Coprini, which have been long studied by one of us (A. H. R. B.), are supplied.

In Manitoba Phallales, except *Dictyophora Rusticola* which is usually found on old waste from lumber mills, are rare. A diligent search for Hymenogasterales has been rewarded by the finding of only two species, specimens of which were submitted to Dr S. M. Zeller. The Lycoperdales are fairly common, and most of them have been named or verified by the late C. G. Lloyd. Of the Nidulariales, which are cosmopolitan, five species have been found, and of the Sclerotermatales three species.

The Fungi Imperfecti of Manitoba are represented in the List by many parasitic forms, as well as by a number of lignicolous and cauliculous saprophytes. The Melanconiales have not been found to be especially numerous, but the Hyphomycetes and Sphaeropodales are very abundant. Future students will find much work to do in extending our knowledge of these groups. Relatively few of the species have been traced to their "perfect" form. For help with several of the parasites our thanks are due to Dr J. J. Davis of Madison, Wisconsin.

For contributing the list of fungi observed on man and higher animals, which is placed at the end of the next Section, the authors are indebted to Dr A. M. Davidson of the Winnipeg General Hospital.

XIV

LIST OF SPECIES.

In the List abbreviations are used for authors' names, months of the year, and certain geographic regions. M.A.C. is used for the Manitoba Agricultural College area described in the Introduction. The (n) before a name implies a measure of doubt in the determination and usually means that the specimen referred to is probably the species or genus named or near it. Measurements, usually in the metric system, accompanying records are based on the material studied, microscopic magnitudes, unless otherwise stated, are given in thousandths of a millimetre—microns—usually with the sign omitted. As a rule, only generic names of hosts are recorded in this Section, the full binomial will be found in the Host Indexes. Where only the conidial stage of an "imperfect" fungus has been collected, it is listed in its place in the Imperfects, usually with a reference to the perfect stage when the latter is known.

At the end of each description of a new species described by Dearness and Busby will be found two numbers, e.g. for *Pyrenopeziza canina* 4082 (D 6719). The former is the number of the co-type specimen in the herbarium at M.A.C., while the latter is the number of the type specimen in the herbarium of John Dearness at London, Ontario.

MYXOMYCETES

MYXOBACTERIACEAE

Chondromyces cresatus B & C On dung and old fungi in the laboratory University of Manitoba and M A C.

ACRASIDAE

Dictyonidium macrospora Peck On dung cultures, University of Manitoba.

PLASMODIOPHORACEAE

Plasmodiophora Aln (W. reesei) Moell Forming galls on roots of *Alnus* Kenora According to a recent investigator *P. Alni* is not a *Plasmodiophora*.

MYXOGASTRIN (in collaboration with Dr W T Elliott)

Arctia cinnam. (Hall) Pres Common at M A C in 1927, on old leaves and poplar wood

-- *decidua* (L. Watton Old wood M A C, Victoria Beach.
lanceolata Pres. Old wood, M A C, Victoria Beach, Bismarck

- *lanceolata* var *fuliginea* Lister River Park, Winnipeg
insignis Kalch & the M A C Previously recorded in North America only from Massachusetts and Montana.
occidentalis Mache Lister On dead wood, M A C and collected by Thremmuth at Winnipeg

alpina Schw Lister Occasional on old wood, M.A.C.

Redhausa decipiens (Kurt) Berk. Old poplar, M A C

macrocarpa (Des) Root Kidman Park, Winnipeg
pauca (Fr) Root Elm Park, Winnipeg, collected by Thremmuth

stricklandii (Hall) Berk. On *Populus*, Victoria Beach.

Ceratomyxa fruticulosa (Muel.) Mache Fairly common on old wood, M.A.C, Victoria Beach.

Comatricha irregularis Her Common, A. R. Shuster

typhoides (Hall) Root Old wood and leaves, Winnipeg, M A C.

Craterium leucosphacum (Pres) Dittus Decayed wood, horse dung, leaves, M.A.C, Victoria Beach, Norway House

minutum Laver) Fr Victoria Beach, M A C

Dichae bulbosus (B & Br.) Lister Old wood, Winnipeg. A rare species.

Dictydactylum pleurochaeta (Schum) Root. On *Crataegus* twigs; M A C

Dictydium cancellatum (Batsch) Mache Decaying wood; M.A.C.

Diloma effusum (Schw.) Morg. Old leaves, M A C

- *globosum* Pers. On wood, M A C Winnipeg, Kerner.

rubrum L. Morg. Dead wood Indian Bay Lake of the Woods

squaroides Fr. On leaves and wood, M A C

Dilymna crustaceum Fr. Rotten poplar M A C

diloma Pers. Duby. Developed several times on horse dung brought in to the laboratory M A C

- *melanopermum* Pers. Macbr. Wood and bark of dead poplars, V. arvensis etc., M A C Victoria Beach

melanopermum var. *minig* Lister M A C

squarulosum (A. & S.) Fr. Common on old ash, willow, herbs, horse dung M A C, Victoria Beach Norway House, Valley River

rusticum Bouchet. On cow dung, M A C. An uncommon species.

Entaridium Roseumum (Roest.) Wang. Norway House, Kerner, Winnipeg.

Fuligo septica L. (Caul.) Common and widespread

septica var. *caudata* Pers. M A C Victoria Beach

Hemitrichia clavata (Pers.) Roest. Common on old wood and woodst. M A C Victoria Beach etc.

- *vagantum* Bouch. Macbr. On dead elm, poplar, etc., M A C

Lamproderma columbianum (Pers.) Roest. Old wood, Victoria Beach

scutillans R. & Be.) Morgan. On dead forest, M A C

violaceum Fr., Roest. Victoria Beach

Leucopus fragilis (Thuria) Roest. On moss and wood, Victoria Beach

Lecan. lamella Desmazis and Duby. n. sp. Thallus paleish white. Spermangia scattered or gregarious, spindle shaped to oval or roundish, wall membranous shining even, reddish purple at first becoming blackish purple, 200-400 μ long by 12-200 μ wide delimitation regular, capillitium consisting only of numerous small smooth threads which may have long knots, spores spherical, purplish but fading in a fluid to white or brown, marked by short a perical or latitudinal line on one side, or irregularly dispersed in areas remainder of spore smooth, 11-13 μ in diameter sometimes larger. On old horse dung culture in laboratory specimens gathered May 21 1928, 22/28 (D 4651) subsequently collected on same material, June 24, 1928, 4652. Resembles *L. hyalina* Morgan in possessing membranous spermangia.

- Lycogala epidendrum* (L.) Fr. Very common; Victoria Beach, M.A.C., etc.
- *flavo-lutescens* (Ehrenb.) Rost. Collected at Winnipeg by Cheeseman
- Hoodia spongiosa* (Leys.) Morg. Common, Winnipeg, M.A.C.
- Oligonema nitens* (Lib.) Rost. Old Salix and other wood, M.A.C.
- Perichaena corticicola* (Patsch, Rost. Common, especially on poplar bark, M.A.C., Victoria Beach.
- *depressa* Lib. On old wood, M.A.C.
- Physarella oblonga* (Berk. & Curt.) Morg. On old fungi, M.A.C.
- Physarum annulatum* Cke. Decayed wood, M.A.C.
- *hilatum* Lister. Poplar bark and old wood, M.A.C.
- *compressum* A & S. Dead wood, M.A.C.
- *confertum* Pers. Old poplar etc., M.A.C., Winnipeg.
- *didermoides* (Achur, Rost. Winnipeg Beach, W. N. Cheeseman.
- *globuliferum* (Bull.) Pers. Dead poplar, M.A.C.
- *leucophaeum* Fr. On wood, Winnipeg, M.A.C.
- *maydis* (Morg.) Torrend. Old wood, M.A.C. Developed in laboratory from sclerotia.
- *mutabile* (Rost. Lister. Herbaceous stems, Victoria Beach, M.A.C., showing a relationship to *P. aculeis*. No other known American record.
- *notabile* Nachr. Old poplar and other wood, common at M.A.C.
- *ovatus* Pers. On debris and poplar wood, M.A.C.
- *notata* var. *robustum* Lister. Dead bark, M.A.C.
- *rubiginosum* Fries. Old leaves, moss on wood, Victoria Beach. A rare species. Our specimens were reddish-brown to scarlet-orange.
- *sinuosum* (Bull.) Waurin. Moss, pine needles, Kenora, Winnipeg.
- *viride* (Bull.) Pers. Old poplar, etc., M.A.C., Victoria Beach.
- *viride* var. *incanum* Lister. Decaying wood; M.A.C.
- Reticularia Lycoperdon* Bull. Old wood, Winnipeg, Victoria Beach, M.A.C.
- Stemonitis ferruginea* Ehrenb. Grass, Victoria Beach, M.A.C.
- *fusca* (Rost.) Rost. Common on dead wood, M.A.C., Treesbank, Victoria Beach.
- *herbacea* Peck. Old poplar, M.A.C.
- *hyperoxyla* Meyl. On wood, M.A.C.

- Trichia concolor* (Ditm.) Roest. Old wood, Winnipeg, M.A.C.
 — *concolor* var. *inconspicua* Lister Winnipeg.
 — *decipiens* (Pers.) Machr. On wood, Winnipeg, M.A.C.
 peridilla Karst. Decayed wood, M.A.C.
 — *seabra* Roest. Old wood, Indian Bay.
 — (n) *subfusca* Roest. On dead wood, Victoria Beach.
 varia Pers. On wood, Winnipeg, M.A.C.
Tulphura Carparyi (Roest.) Machr. Old Cornus, M.A.C.
Steruginosa (Batsch) Gmel. Victoria Beach.

BACTERIA PARASITIC UPON CULTIVATED PLANTS

- Bacillus amylovorus* (Burr) Trev. Injurious on apple; Morden, etc. First outbreak at M.A.C. in 1924.
 — *strosepticus* van Hall. Common on potatoes.
 — *carotovorus* L. R. Jones. Common on celery and other hosts.
 — *caulivorus* Prill. & Del. Frequent on geranium cuttings, Winnipeg.
 oleraceae Harr. On cabbage and cauliflower, Winnipeg, M.A.C. (Perhaps same as *B. carotovorus*.)
 — *Boeghi* Burr. On Sudan grass and the sheaths of corn, M.A.C.
 — *tracheliphilus* E.F.S. Reported on cucumber, sometimes confused with mosaic.
Bacterium Delphinali (E.F.S.) Bryan. On larkspur, Morden, Brandon, Winnipeg.
 — *marginatum* McC. On *Gladolus*, Winnipeg; A. M. Brown.
 michiganense (E.F.S.) Stev. On tomato, Brandon, I. L. Connors.
 — *stratifolius* Elliott. Common on oat leaves, M.A.C. and elsewhere.
Pseudomonas atrofaciens (McC) Stev. Occasional on wheat, M.A.C., Oakville.
 — *campestris* (Pers.) E.F.S. Reported on crucifers.
 — *coronaticus* (Elliott) Stev. Not common on oats, M.A.C.
 glycines Coor. (or *B. Soyas* Wolf). On soybeans, M.A.C.
 — *lachrymans* (Sm. & B.) Carr. Common on cucumber leaves; Winnipeg, M.A.C.
 Phaseoli E.F.S. Often injurious to beans, Norway House, M.A.C.
 — *Fid* Rickett. On garden pea, M.A.C.

Pseudomonas radiicola (Bey.) Moore. On native as well as cultivated legumes.

— *translucens* J J & R. On barley leaves, M.A.C.

— *translucens* var *Secalis* R. G. & J. On rye leaves, M.A.C.

translucens var *undulosa* J J & R. Common on wheat.

tumefaciens (S & T) Stev. Occasional on cultivated roses and plums, M.A.C., Brandon, Winnipeg.

PHYCOMYCETES

CHYTRIDIALES

Cladochytrium maculans (Wallr.) Graft. On *Alnus*, *Betula*, *Vitis*, I. L. Connors.

Phyodermis Menyanthes de Bary. On *M. trifoliata*, Girik, I. Johnson.

Synchytrium aureum Schrost. On *Petalostemon*, Brandon.

— *descriptum* Parl. (*Woronella scandens* (Pk.) Syd.) On *Falcatia* (*Amphicarpa*), common.

SAPROLEGNIALES

Have not been studied, but many have been observed.

PERONOSPORALES

Ablaga Billi (Biv.) Kze. Common on *Asarum*; on *Monolepis* at Kelwood.

— *candida* (Pers.) Kze. Common on *Bursa*, *Lepidium*, *Nema*, *Norta*, *Radicula*, *Raphanus*, *Sinapis*.

Portulacae (DC.) Kze. Frequent on *Portulaca*.

Tragopogonis (DC.) S. F. Gray. On *Cirsium*, M.A.C., Sta. Rose.

Radiophora Kellermanii (E. & H.) Wils. Common on *Iva*.

Bremia Lactucae Regel. On *L. polchella*, Swan River.

Peronospora alla Fckl. On *Plantago*, M.A.C., Minaki, Brandon, Birtle. Common in 1928.

— *Arthurii* Parl. On *Oenothera*, Virden, Kilmory, 1928.

Corydalis de Bary. On *Corydalis sempervirens*; Norway House, 1928.

— *effusa* (Grev.) Rabb. On *Chenopodium* and *Spinacea*, common.

— *parasitica* (Pers.) Tul. Common on *Brassica*, *Bursa*, *Cherita*, *Lepidium*.

— (?) *Polygoni Thuesen*. Causing brown spots on rhubarb leaves Valley River.

— *Potentillae* de Bary. On *Siererra*, Garwood, W. L. Gordon, 1928.

— *Trifoliorum* de Bary. On *Astragalus* and *Medicago*; Treewbank, M.A.C., Brandon.

Puccinia Tulas (Dierk.) de Bary On *P. strumarum*,
Dierksen, M.A.C.

Pyrenopeziza infestans (Mont.) de Bary On potato. First
found in 1917 widespread and common in 1923.

- **parvula** Dierks On Callunas. Reuter, W. L. Gordon,
1923.

Trachyspora Wals. & Dierks On *Thalictrum*. M.A.C., 1923.

Puccinia Halimifoli (Pers.) Rehl. & de T. Common on Am-
bronia Helena, Helianthus Raddeanus.

Helianthi Schreb. On *Helianthus*. River River, Brown
River.

Helianthi Schreb. On Helian. Manitoba M.A.C.

Vitis Pers. On *V. opulus*. M.A.C. Leitch.

Vitis H. & C. (Pers.) Rehl. & de T. On *Vitis rotundifolia* (Mill.),
first found in 1917 at M.A.C. and Morison but it did not
survive the winter and was not found in 1923.

Puccinia-Puccinia Humuli Wyal. & Tula. W. L. de Bary. On
H. lupulus (Mill.). This highly interesting rust was re-
ported previously for North America only from Wisconsin,
was collected at M.A.C. on Sept. 9, 1913, and at Minnaka,
Ontario, Sept. 22, 1923. It is evidently a part of our
native fungus flora.

Pythium deBaryanum Henn. Occasional on seedlings.

Sclerotinia graminicola (Pers.) Schreb. On *Chenopodium*,
Humulus, common at Brandon in 1923.

NUCULALES

Chaetochytrium Breb.ii van Tigh. On dung cultures,
M.A.C.

Blumer blanda (L.) Pers. A common saprophilous fungus
common on Fesc. Often even more common than the
preceding and distinguished from it by oblong-shaped
in the mycelium.

Pyrenopeziza Helianthaceae (Pers.) P. helianth. Aust. In
common in dung cultures. University of Manitoba.

Phoma crystallina Wigg. Tula. On dung. Winnipeg,
M.A.C.

-- **Elmii** van Tigh. Rather common on horse-dung
cultures. University of Manitoba.

- **longipes** van Tigh. Common on dung. Winnipeg,
M.A.C.

- **calipes** Mont. This rarely collected fungus was found on
the typical habitat of night remains on mud along the
Red River Winnipeg. C. W. Love.

Pythomyces Prostratus de Bary Parasitizing *Monilia* in
dung cultures. University and M.A.C.

Rhizopus nigricans Ehr. Present everywhere, causes some losses to food products. Both plus and minus forms have been found producing zygospores in culture.

Syncephalis sphaerica van Tiegh. On horse dung, M. A. C. Another species, unidentified, is found as a parasite of *Pilobolus*.

Styphelia Aspergillus (Scop.) Found (*Sporophus grandis* Lenz). Common on old mushrooms.

Thamnidium elegans Lenz. Occasional on dung cultures, University and M. A. C.

ENTOMOPHYTHALES

Empusa Aphidis Hoff. On aphids, M. A. C.

— **Musca Colvi**. In its usual autumn prevalence on house-flies.

Entomophthora Grylli Fros. Sent to by Norman Criddle from Treebank on *Discocteria*, *Melanopus* and *Ctenocha*.

viridescens Thall. On cutworms, M. A. C.

Tarichium megasperum Colv. On cutworms, M. A. C.

ASCOMYCETES

PROTOMYCETALES

Momaxia purpurea Went. On silage, Brandon. Not commonly found. The silage and fungus were as described in *Mycologia*, II, 391, but the live-stock was not poisoned, perhaps because some care was taken not to feed the animals with the moldy portions. In Manitoba there have been a number of cases of death of live-stock from eating nearly sweet clover both as dry forage and silage, but in the clover no definite mold has been found as a characteristic inhabitant. We are inclined to agree with the veterinarians that split proteins or other components of the decaying substratum are the poisonous agents, rather than the fungi themselves, if indeed the fungi are involved at all.

SACCHAROMYCETALES

Many "wild" yeasts occur and cause fermentative injury to fruits, food materials, meat in storage, and slime flux in wounds of trees.

PROTODISCALES

Emmonsia Cerasi (Fekl.) Sadleir. On *Prunus Baccata* and the hybrid *Prunus Baccata* × *P. triflora*, Morden, M. A. C.

— **Pruni** Fekl. Common on cultivated plums throughout Manitoba. Can be controlled by spraying.

Tapirina corallascens (Mont. & Sacc.) Tul. On oak leaves ; common.

HELVELLALES

Colosia cretacea (Pers.) Fr. In deep fir woods, Victoria Beach, Minsk.

Cyromitra secunda (Pers.) Fr. Recorded from Kenora. One of us (J. D.) investigated fatal poisonings at Aylmer and Tilsonburg, Ont., caused by eating this fungus.

Helvella crispata (Neop.) Fr. Common. Victoria Beach, Gorda, Kenora.

clavata Bull. Mixed woods, Kenora.

- *lobata* Schaef. Common among rotifers, often bearing *Sphaeronemella*.

- *Mitra* L. (*H. lacunosa* Afs.) Russell, M. A. C., Kenora, Victoria Beach.

- *sphaerogpora* Fr. On decayed wood, not uncommon in the spring at Victoria Beach and Elk Island. Spores spherical, all the other known species of *Helvella* have elliptical spores.

Leotia lubrica (Neop.) Pers. In coniferous woods, Kenora.

lubrica form *Lloydii* (Rehm.) Durand. A greenish form, Minsk.

Mitrella irregularis (Fr.) Durand. Common, Kenora, Minsk, Victoria Beach.

Maraschia angustiloba Fr. In woods, M. A. C., Victoria Beach.

- *conica* Pers. Wooded areas, M. A. C., Victoria Beach.

crustacea (Vahl.) Pers. Victoria Beach to M. A. C. and Minsk.

exulans L.; Pers. Widespread in open woods in June.

Spathularia clavata (Schaef.) Sacc. Norway House, Victoria Beach, Ingoil.

Underwoodia columbaaria Fr. This interesting and rare fungus was found at M. A. C. in deciduous woods on July 13, 1937. Two cream coloured horn like specimens 15 and 20 cm long were projecting for half their length from the leaf mould. Three more specimens were found at the same spot on July 28, 1938, and several more on Aug. 1, 1938, about a mile from the first location.

Tarpe lobosum (Kromb.) Schrot. Common in the woods at M. A. C. in mid May 1937 (Gunders and Gordon), collected by W. F. Hanna about the same time at Edmonton, Alberta, not found since.

- *conica* (Muhl.) Sacc. Halstead Beach, M. A. C., May.

PREIXALES

1. *Operculatus*.¹

- Aleuria aurantia* (Pers.) Fekl Ingolf, Minaka, etc
Aleurina (n) *atrovinosa* (Cke.) Seaver Damp soil, M.A.C.
Ascoholus carbonarius Karst. On burnt soil, M.A.C.
 — *geophilus* Seaver On damp soil, M.A.C.
 immersus Pers. Common on dung in cultures, Winnipeg, M.A.C.
 — *stercorarius* (Bull.) Schroet. On dung, Elk Island, Gosh, M.A.C.
clitelliporus (E.L. & Dorn.) Seaver Known only from Canada. First collected by one of us (J.D.) at London, Ont., collected three times at M.A.C. on old leaves in a slough as it dried up, June to Aug.
Ascotholus carnosus (Pers.) Boud. On dung of horse, cow, and goat; M.A.C.
 — *granulatus* (Bul.) Speng. On dung of cow and horse, M.A.C.
 — *lactens* (C. & P.) Sacc. On dung of cow, horse, and rabbit, M.A.C. 8-13 x 5-8.
Bulgaria melastoma (Sow.) Seaver On old wood, Victoria Beach.
Diadema ancilla (Pers.) Sacc. On mossy wood, Victoria Beach.
Geopyxis bronca (Pk.) Seaver On much decayed wood, Victoria Beach. Apparently rare.
 copularis (L.) Sacc. On charcoal, Kamora.
Humaria leucoloma (Hedw.) Seaver Among mosses, Minnau.
 semiummers, Karst.) Seaver. On damp soil, M.A.C.
Lamprospora Constellata (B. & Br.) Seaver. Damp soil; Victoria Beach, M.A.C.
 - *lactiflua* (Cke.) Lagerd. On sandy soil, Victoria Beach.
Leucobolus equinus (Muhl.) Karst. On dung, M.A.C.
Melastoma Charteri (W. G. Sm.) Boud. Common on sawdust in an emptied ice-house in autumn, M.A.C.
Patella alba (Schweff.) Seaver Common, Victoria Beach, Kamora, M.A.C.
 — *albocincta* (B. & C.) Seaver. Among moss, Kamora.
 - *coprinaria* (Cke.) Seaver On cow dung, Victoria Beach, Black Island.
 melastoma (A. & S.) Seaver. On burnt ground, M.A.C.
 - *scutellata* (L.) Moeg. Everywhere on old wood.

¹ Names of species as in F. J. Seaver's *North American Cup fungi* (6).

- Polyporus strobilatus* (Pers.) Wulst. On cow dung, Victoria Beach, M.A.C., Brandon.
- Helvelloides* A. & S. Nees. On woodst and debris, with *Helveticus* / *auratus*, M.A.C.
- Polyporus Acetabulum* (L.) Kuntze. In woods, M.A.C.; July.
- Corium* (Wulst.) Nees. On sand in mixed woods, Victoria Beach.
- *limbata* (Schwef.) Nees. On rotted logs, Victoria Beach; Aug.
- solitaria* (Pers.) Kuntze. On the ground in woods, M.A.C.
- Porrella laticornis* (A. & S.) Bond. On wood, Victoria Beach, June.
- Polyporus luteus* Pers. On soil or old wood, Victoria Beach, M.A.C.
- *domesticus* (He) In a cellar, M.A.C., Aug.
- *repanda* Pers. On old logs, Victoria Beach, Ingolf, M.A.C., June, Aug.
- gylvastris* Bond; M. & T. On woodst and soil, M.A.C., Aug-Oct.
- *reticulatus* Hall. On dung, etc., Norway House to M.A.C. and Kenora.
- velutinus* Pers. On charcoal, M.A.C., Aug.
- Flaccidula coccinea* Nees; Fck. *Sarcocypha coccinea*. - Bear-let Cup 1. This conspicuous fungus has never been found in Manitoba but it was sent in from North Dakota, one half mile south of the Manitoba boundary on Mar 27, 1927 so that it is probably present in the extreme south of the Province. We could not have overlooked it, had it occurred around Winnipeg.
- Mamalia* Nees & Bernst. Nees (*Sarcocypha protracta*). Sometimes abundant among poplars or in mixed woods, Victoria Beach Indian Bay Hartington Winnipeg, M.A.C. We have also seen specimens gathered near Edmonton, Alberta.
- Pseudoplectrania fulgens* (Pers.) Fck. Amongst cedars, Victoria Beach, May-June.
- *nigrella* (Pers.) Fck. On decaying wood, Victoria Beach; May.
- *vesiculata* (Pers.) Nees. On old wood Victoria Beach, June.
- Pileopsis ramularia* Berk. On wet leaves, M.A.C.
- Pyrenopeziza capsula* (Fractum and Berl.), n. sp. Apothecia 1-2 mm. broad, gregarious but separate, umbonate at first, becoming saucer-shaped or flat, yellow then brown, finally dark grey and retaining their open shape when

dry, firm, sessile, seated on a delicate, thin, radiant tapestrum consisting of hyaline, branching hyphae, 2-5 μ thick. Hypothecium thin, short-celled, brown. Asci cylindrical, 8-spored, 90-120 \times 8-10 μ , not turning blue with iodine, paraphyses filiform, straight, equal of the asci, gradually enlarged to the slightly thickened ends. Spores 1-seriate, smooth, elliptic, nearly hyaline, 11-12.5 \times 6-7 μ with one central oil drop 3-4 μ in diameter.

On dog dung, Norway House, Man., Aug. 28, 1928; 4983 (D 8719). There is a rather abrupt change of colour from yellowish to brown as the apothecia mature, indeed, at first sight, one might easily suppose two species to be present.

Pyrenopeziza omphalodes (Bull.) Fekl. On charcoal, M.A.C.

Rhizina inflata (Schoeff.) Karst. Rare at Victoria Beach and Kemora.

Rhytisma crustaceus (Fekl.) Rehm. On rabbit dung, M.A.C.

mitis Mout. On dung of goat and rabbit, M.A.C.

polysporus (Karst.) Sacc. On dung, M.A.C.

Saccobolus depauperatus (E. & Br.) Phill. On horse dung, M.A.C.

Sordellina grandis (Pers.) Saccar (*Ondes grandis*). On damp soil, Victoria Beach.

— *leporina* (Batsch, Gray) In woods, M.A.C., Victoria Beach, Menzies.

Uromyces Craterium (Schw.) Fr. Victoria Beach, Indian Bay, M.A.C., May.

2. *Inoperculatae*.

Catinella nigro-olivacea (Curr.) Boud. On old wood, Victoria Beach, M.A.C.

Oenangium farfugaceum (Both) deNot. Common on hazel, occasionally on other shrubs.

populeum (Pers.) Rehm. Common and variable on poplar, rare on ash, Victoria Beach, M.A.C.

— *populeum* var *prunetinum* Rehm. On choke-cherry, M.A.C.

Chlorosplenium aeruginosum (Nyl.) Karst. On old wood, Victoria Beach, Kemora. 6-8 \times 3-5 μ .

— *aeruginosum* (Oed.) deNot. On old willow, etc.; Gimli, Victoria Beach, M.A.C. 10-13 \times 2-3 μ . Probably this species is also found at Norway House.

— *versiforme* (Pers.) deNot. On coniferous wood; Victoria Beach. 12-15 \times 3-4 μ .

- Clavaria* (s) *reflexana* (Weberh.) Sacc. On spruce stems, Indian Bay.
- Coryna atrocinerea* (Pers.) Frkl. On old poplar, Kenora, M & C. Indian Bay.
- *purpurea* Frkl. (possibly same as preceding). On wood, M & C.
- Dasyscypha Agavealis* (H. & C.) Pers. Common on Agave, Victoria Beach, Kenora.
- *constricta* (Roth) Sacc. On fern fronds, M & C.
- (s) *dryina* Karst. Sacc. On old wood, Matlock.
- Helium* (Hedw.) Sacc. On decorticated wood, M & C.
- (s) *sporobricha* (Dul.) Hedw. (Pl.) mulberry stems, M & C.
- Dermatis* = *Cornu* Pers. (det. N. S.) On old wood, Kenora.
- *fulva* (L.) Hedw. On Cornus branches, M & C.
- Geopyxis nebulosa* (Fr. Sacc. (A. C. C. C. according to Sacc.) On old wood, Matlock.
- Helotium citrinum* Hedw. Fr. Common Norway House to M.A.C., Sifton to Kenora.
- *epiphyllum* Pers. Fr. On fallen leaves of poplar, etc.; Munk.
- *phyllophilum* Owen. Karst. Old leaves, M & C.
- schodum* Fr. On willow twigs, M & C.
- Hysteropeltella elliptica* (Fr.) Hedw. On wood of willow; M & C.
- Prostia* (Dul.) Hedw. On stem, disjunct, etc., M & C., Par to H.
- Karstenia agropyra* (Fr.) Sacc. On Amelanchier, Kenora, St. Norbert, M & C.
- Lachnella corticola* Fr. Common on poplar bark, Sifton to M & C.
- *fu. papillaris* (Dul.) Karst. On wood, Stony Mountain.
- Lachnum laccos* (Poll.) Karst. On Rubus, Betula, etc., Victoria Beach, M & C.
- *fu. nidulus* = *fu. K.* Karst. Old thistle stems, M & C.
- Leicographa* = *brunnea* Hedw. On old birch wood, Lundy.
- Mediola crassipes* (K.) Phl. On Phragmites Dauphin.
- (s) *atrocinerea* (Fr.) Phl. On old thistle and rust stems, M & C.
- clavaria* (Hedw.) Karst. Common on wood, M & C.
- Dufourea* Karst. On living Potentilla, Dauphin, Carberry, Melbourne.
- (s) *reflexa* Sacc. On old grass, Brandon.
- Pezizaria atrata* (Hedw.) Fr. Common on old poplar, etc., M & C.
- *clavipes* H. & S. On old Cornus, M & C.

- Patellae sanguinea* (Pers.) Rehm. On dead oak wood ; M.A.C.
- Patellula* (n) *viridoflavescens* Rehm. Old wood ; M.A.C., Birds Hill.
- Phiala ameni* (Bat.) Quel. On poplar catkins, Indian Bay M.A.C.
- synthoides* (Bull.) Gill. Common on old herbaceous stems, M.A.C.
- *fructigena* (Bull.) Gill. On fallen acorns, M.A.C.
- (n) *scutula* (Pers.) Gill. On old Polygonum stems, M.A.C.
- volgaris* (Fr.) Rehm. On dead wood and twigs, Victoria Beach, M.A.C.
- Pseudopeziza Medicagoe* (Lib.) Sacc. Common on alfalfa and slightly injurious.
- repanda* (Fr.) Karst. On Galium, M.A.C. and Birds Hill.
- *Trifolii* (Derrh.) Fekl. On clover, Minaki, I. L. Concern.
- Pyrenopeziza* (n) *compressula* Rehm. On old nettle, M.A.C.
- Medicagoe* Fekl. Occasional on alfalfa, M.A.C.
- Salicetina Betulae* Wor. On fallen birch catkins, Indian Bay.
- *americana* (Wormsk.) Norton & Easkol. On cultivated plums and cherries, M.A.C., Morden, Brandon. Not serious.
- *sclerotium* (Lib.) Mass. Often injurious to sunflowers, lettuce, carrots, parsnips, and cabbage in the field or in storage, occasionally on cucumber, dahlias, clover, alfalfa, may attack weeds such as nettle, thistle, sow-thistle. Widespread.
- *pseudotuberosa* Rehm. A specimen on a blackened acorn, M.A.C.
- Taparia Rosae* (Pers.) Fekl. On old rose stem, M.A.C.
- Trichopeziza albulus* (Pers.) Sacc. On old wood, M.A.C.
- Tympanis pinastri* Tul. On coniferous wood, Kenora.
- *sphaerosporea* Nyl. (*T. populina* (Fekl.) Sacc.) On dead poplar bark, M.A.C.
- STICTIDACEAE**
- Cryptomyces Floridis* (Reb.) Rehm. On *Pteris aquilina*, Minaki.
- Ocellularia oculata* (Pers.) Schroet. Occasional on Salix twigs, M.A.C.
- Ostropa cinerea* (Pers.) Fr. Common on poplar, oak, ash, elm, willow ; M.A.C.
- Propolis fusinea* (Schrad.) Karst. On poplar, ash, oak, Kenora, M.A.C.

Year	Month	Number of cases	Number of deaths	Number of recoveries
1998	Jan	1	0	1
1998	Feb	2	0	2
1998	Mar	3	0	3
1998	Apr	4	0	4
1998	May	5	0	5
1998	Jun	6	0	6
1998	Jul	7	0	7
1998	Aug	8	0	8
1998	Sep	9	0	9
1998	Oct	10	0	10
1998	Nov	11	0	11
1998	Dec	12	0	12
1999	Jan	13	0	13
1999	Feb	14	0	14
1999	Mar	15	0	15
1999	Apr	16	0	16
1999	May	17	0	17
1999	Jun	18	0	18
1999	Jul	19	0	19
1999	Aug	20	0	20
1999	Sep	21	0	21
1999	Oct	22	0	22
1999	Nov	23	0	23
1999	Dec	24	0	24
2000	Jan	25	0	25
2000	Feb	26	0	26
2000	Mar	27	0	27
2000	Apr	28	0	28
2000	May	29	0	29
2000	Jun	30	0	30
2000	Jul	31	0	31
2000	Aug	32	0	32
2000	Sep	33	0	33
2000	Oct	34	0	34
2000	Nov	35	0	35
2000	Dec	36	0	36
2001	Jan	37	0	37
2001	Feb	38	0	38
2001	Mar	39	0	39
2001	Apr	40	0	40
2001	May	41	0	41
2001	Jun	42	0	42
2001	Jul	43	0	43
2001	Aug	44	0	44
2001	Sep	45	0	45
2001	Oct	46	0	46
2001	Nov	47	0	47
2001	Dec	48	0	48
2002	Jan	49	0	49
2002	Feb	50	0	50
2002	Mar	51	0	51
2002	Apr	52	0	52
2002	May	53	0	53
2002	Jun	54	0	54
2002	Jul	55	0	55
2002	Aug	56	0	56
2002	Sep	57	0	57
2002	Oct	58	0	58
2002	Nov	59	0	59
2002	Dec	60	0	60
2003	Jan	61	0	61
2003	Feb	62	0	62
2003	Mar	63	0	63
2003	Apr	64	0	64
2003	May	65	0	65
2003	Jun	66	0	66
2003	Jul	67	0	67
2003	Aug	68	0	68
2003	Sep	69	0	69
2003	Oct	70	0	70
2003	Nov	71	0	71
2003	Dec	72	0	72
2004	Jan	73	0	73
2004	Feb	74	0	74
2004	Mar	75	0	75
2004	Apr	76	0	76
2004	May	77	0	77
2004	Jun	78	0	78
2004	Jul	79	0	79
2004	Aug	80	0	80
2004	Sep	81	0	81
2004	Oct	82	0	82
2004	Nov	83	0	83
2004	Dec	84	0	84
2005	Jan	85	0	85
2005	Feb	86	0	86
20				

Proposition 1. *Let \mathcal{H} be a Hilbert space and let $\mathcal{H}_1, \mathcal{H}_2$ be subspaces of \mathcal{H} . Then, the orthogonal decomposition of \mathcal{H} with respect to \mathcal{H}_1 and \mathcal{H}_2 is given by*

The first series of experiments described above, May 8, 1974, is summarized in Table 1. The

For a given process π , $\mathbf{I}(\pi)$ is defined as follows. Let $\mathbf{I}(\pi)$ be the set of all $\mathbf{I}(\pi)$ such that $\mathbf{I}(\pi)$ is a $\mathbf{I}(\pi)$ and $\mathbf{I}(\pi)$ is a $\mathbf{I}(\pi)$.

Epidermella naga. From [area] the present [area]
[area]

Year	Number of cases	Percentage of cases	Number of deaths	Percentage of deaths
1990	1,000	100	100	100
1991	1,000	100	100	100
1992	1,000	100	100	100
1993	1,000	100	100	100
1994	1,000	100	100	100
1995	1,000	100	100	100
1996	1,000	100	100	100
1997	1,000	100	100	100
1998	1,000	100	100	100
1999	1,000	100	100	100
2000	1,000	100	100	100
2001	1,000	100	100	100
2002	1,000	100	100	100
2003	1,000	100	100	100
2004	1,000	100	100	100
2005	1,000	100	100	100
2006	1,000	100	100	100
2007	1,000	100	100	100
2008	1,000	100	100	100
2009	1,000	100	100	100
2010	1,000	100	100	100
2011	1,000	100	100	100
2012	1,000	100	100	100
2013	1,000	100	100	100
2014	1,000	100	100	100
2015	1,000	100	100	100
2016	1,000	100	100	100
2017	1,000	100	100	100
2018	1,000	100	100	100
2019	1,000	100	100	100
2020	1,000	100	100	100

passage from the mountains on the north of North Cove, Victoria Beach, Indian Bay

[illegible]

House, Victoria Beach, N.A.C.

Lepidus apicalis (Linn. f.) (the old pair *Lepidus* and *Lepidus* sp. n. 1843, 1844, 1845)

1. *apiculatus* 1: Hysterium only 0.2-0.4 mm long, spores 10-12 x 3-4 μ , no reticulate mark, Norway House

Lophodermium piceae (Schrad.) Chev. On pine, Norway House, Elk Island.

Erysiphe paucispora (Uls.) Sacc. On catkins wood, Norway House.

TUBERALES

Tuber sepiaria Galkay. One specimen was found in Assiniboine Park, Winnipeg, by C. W. Lowe, Sept. 1922.

AMMORIACEAE

Botrytis herbariorum Wigg. Link. On damp specimens and cultures, Winnipeg.

Gymnospora n. *Reesii* Harms. On a dung culture. M. A. C.

Oospora equina W. & P. Pers. Occasional on old horses.

Asporium A. & S. Collected on feathers. Murak.

PERIDOPORALES

Asporium Odlingi (Petr.) v. Huhn. (Immersosporium) Causes a rotting and injurious white-brown on *Angelica*.

Asterina n. *arida* Pk. On *Aster* seedling. Elk Island.

rubicola K. & E. On raspberry leaves, Winnipeg, W. Popp.

Erysiphe Ochroleucorum Lk. Winnipeg, collected on *Ambrosia*, *Aster*, *Galium*, *Habenaria*, *Lappula*, *Monarda*, *Plantago*, and *Rudbeckia*.

Oospora Lk. On *Stachys*, Ste. Rose. M. A. C.

graminis Lk. Common on *Agropyron*, *Agrostis*, *Hordeum*, *Panicum*, *Poa*, *Secale* and *Triticum*. Injury in the field seen only on rye and that slight.

- *Polygoni* Lk. Found on *Amphicarpus*, *Cuscuta*, *Delphinium*, *Glycyrrhiza*, *Lathyrus*, *Pisum*, *Polygonum*, *Thalictrum*, and *Trifolium*. Injurious to *lupinus*. First appeared on red clover in 1922 injurious in 1923 somewhat less prevalent since. Physiological specialization evident in the field.

Heterostella Asteridium: *Limonia* *Deurusa* n. sp. Perithecia flat, circular, cartilagenous, cupulate, minute 100-120 μ , stippled, grooved, seated on hyaline anastomosing hyphae which form a narrow fringe not visible under a hand lens, 80-90 μ wide around the perithecia. Asci globose to sub-globose 20-27-12-16 μ , apophyses 4. Spermogones hyaline, slightly curved, 3-septate, 12-18 \times 2 μ . On living and withered leaves of *Lambium boreale* var. *americanum*, Victoria Beach, Man. June 22, 1922. G. H. Bailey, L. L. Currier, and T. Johnson. 1927. Also at Newcomb, N. Y., June, 1922, H. D. House. (D 4419).

- Microphoma Alai** (Wallr.) Wint. On *Alnus*, *Corylus*, *Syringa*, *Viburnum*. Widely distributed.
- Alai** var. **Longicornis** (Schlecht.) Salmon. Morden, Victoria Beach, Can.
- reticuladophora** Atk. On oak, M.A.C.
- diffusa** (K. & Pk.) On *Lathyrus*, Roston, Winnipeg, M.A.C.
- Symphonocarpi** Howe. On *A. canadensis*, M.A.C.
- Oidium Chrysanthemi** Rob. Trivial name in greenhouses.
- Phyllosticta corylea** (Pers.) Karst. On *Betula*, *Celastrus*, *Cornus*, *Corylus*, Victoria Beach, M.A.C.
- Podophoma Oryzanthidis** (Lk.) de Bary. On *Prunus*, often injurious. *Amelanchier*, Valley River, M.A.C., Morden, Kansas.
- Sphaerotheca Humuli** Lk. Burr. On *Agrostis*, *Fragaria*, *Geum*, *Himelich*, *Rhus*, *Rosa*, *Rubus*. Common.
- Humuli** var. **fuliginosa** (Schlecht.) Salmon. On *Bidens*, *Lepargyrea*, *Leontodon* (*Taraxacum*), *Viola*, Swan River to M.A.C.
- more-eros** (Schw.) B. & C. Common since 1925 on cultivated black current, often injurious, found also on wild black current, Victoria Beach.
- pusilla** (Wallr.) Lev. (consists attributed to this fungus on cultivated roses. M.A.C. Holland).
- Uromyces circinalis** C. & P. On *Acer spicatum*, Victoria Beach, Kansas, from Musaki with many 4 spored asci and the spores about double the usual size.
- zeaeae** (Schw.) Burr. On *Virginia* creeper, Bethany, M.A.C.
- parva** C. & P. or a form on wild strawberry, M.A.C. Agrees with description except that the appendages are rather too long and thick.
- Scleria** (Lk.) Wint. Common on poplars and willows everywhere.

HYPOCHYTRALES

- Calocetria Dearwoodii** E. & R. (perhaps the same as *C. dominata* (Berk. R. & V.) On *Nemora* on *Amelanchier*, M.A.C. Spores 21-28 x 6-7 μ , becoming 3 septate.
- Chromocrea gelatinosa** (Tode) Saver. On willows. M.A.C.
- Claviceps purpurea** Fr. Tul. Collected on *Agropyron*, *Bromus*, *Calamagrostis*, *Dactylis*, *Elymus*, *Hieracium*, *Parientaria*, *Phalaris*, *Ptilium*, *Poa*, *Scirpoides*, *Sorale*, *Spartina*, *Stipa*, and *Triticum*. Norway House and southward injurious to rye in damp summers and causing dockage at the elevators. Common on wild grasses, especially *Agropyron*, from which rye and wheat doubtless

perceive spores. Not constant on barley, not observed on oats. Durum wheats sometimes locally infected, even mowed on the wheat varieties Ruby and Larnet, but rare on Marquis. There can scarcely be ground for attributing variety Triton (Buff and Myr France 34 192) and still less cause for his calling it *Corynephorus Triton Manitobae* (Ibid. See Park Log France 3 40), nor that the 3 378. Livestock sometimes poisoned, especially when fed with eye screenings. A farmer in Western Manitoba once lost 30 head of cattle, and an investigation showed that he was feeding ground screens once containing 500 grains of ergot to the galton, at the rate of two gallons per day.

Corynephorus clavatus (Schw.) F. & E. On *Lactarius*, M. A. C.
malvarum L. Loh. Reported on grubs. Travelled, N. Cadden.

Oreonectria purpurea L. Sower. (*Ascidia cinnabarina* Waterspread) on *Cladostomum*, *Fraxinus*, *Betula*, *Spiraea*, etc.

Eleutheromyces subulatus Tulas. Felt. On old mushrooms and a spore. Norway House, Victoria Beach.

Epichloe typhina (Pers.) Tul. On grass, rare. M. A. C.

Gibberella fusigera (Mont.) Sacc. On old corn stalks, M. A. C. Only the *Peridermium* stage so far has been found on wheat.

Hypocrea chionea F. & E. On old wood, M. A. C. Previously reported only from London, Ont.

— *albina* Pers. Fr. On *Fomes* and *Polyporus*. Victoria Beach, Ingot.

patella L. & P. On poplar and *Hypoxylon*, etc., St. Norbert, M. A. C.

— *pallida* F. & F. On old *Polyporus pubescens*. Kenora, Ingot. Pers. Fr. On old wood, probably poplar. M. A. C.

Hypocrea apiculata Ph. Sower. Old wood. M. A. C.

— *serotina* Pers. Tul. On old *Polyporus*. Victoria Beach, M. A. C.

lactinarum (Schw.) Tul. Common about Winnipeg on *Lactaria*, especially *L. populea* (L.) S.

— *resolva* (A. & S.) Tul. On old fungi. Ingot, M. A. C.

Helenospora lagenaria Pers. Felt. On old *Fomes*. Victoria Beach. Aca. evanescent, spores 10-15 x 6-8 µ.

Dothidea stiphaeria Tul. Fr. On *Lutysia*. Dairype, etc., Kenora, M. A. C.

Peziza Tul. Fr. On old wood, Winnipeg. M. A. C.

Pezizella viridis (A. & S.) Sacc. On *Russula*, *Lactarius*, Victoria Beach, Minaka, M. A. C.

Ectosaccaria balsamea (C. & P.) Beaver Common on
Abies. Miraki, Kootenai, Victoria Beach.

Tyrosaccaria borealisensis (Racc.) Beaver On Ribes, M.A.C.

DOTHIDIALES

Curryella Babji Dearness n. sp. Stromata black crumpled,
imbedded by the cuticle, seated in the cortex, circular
or irregular or confluent 0.5-2 mm. mostly about
1 mm. in diameter and 0.25 mm. thick. Local & 15
in a stroma hairy & g. dense, 125-160 μ exceptionally
up to 250 μ . Asci thick walled, cylindrical clavate,
75-100 \times 12-16 μ . Spores hyaline at first 2 celled
and constricted upper cell much the larger, each cell
becoming 2-3 trans-septate with one long septum, the
whole spore bluntly pointed, ditrysosporous, constricted
in the middle 20-24 \times 7-10 μ across the upper cell,
5-6 μ across the lower one.

On dec. branches of *Prunus* sp., G. H. Babji and
W. L. Gordon, Apr. 22, 1928, M.A.C. 2857 (D 5247).

Curryella Babji Schnitz. on Ribes has some similar
features.

Dibryon morbosum (Schw.) T. & G. Causes Black knot,
a. localized on Prunus, especially choke-cherry.

Dothidea ribesii Fr. On Ribes, M.A.C.

Montagnella Helopetidia (Schw.) E. & E. Immature on
(?) Aster, Grotto. C. W. Lowe.

Phyllostera graminis Pers. Fekl. On Agropyron, Fagmus,
Muhlenbergia, Panarium, Daugduin to M.A.C.

Rhizelia (Fr.) Fekl. On *H. lanatum*, Winnipeg Beach.

SPHAERIALES

Chaetomiaceae

Chaetomium bostrychodes Zapf On dung of sheep and goat,
M.A.C.

— **glabrum** Kunze Common on old wheat straw and others.

micromum (as. On old wood and dung, M.A.C.

Sordariaceae

Deltichia laevis Mouton. This fine species is apparently a
new record for North America. Found first in Belgium,
and later in England (Mason and Salmon Ann. Bot.,
15 344 1901). The spores are 40-58 \times 12-18 μ in our
material, and are provided with hyaline appendages
extending about 10 μ beyond each of the two cells of the
spore. On old horse dung in culture at M.A.C.

— **Marshalli** Berl. & Vogl. On rabbit dung, M.A.C.

Finasteria bombaridicola (Auerw.) Grev. & Neave. Agnus except that the spores are only $12-25 \times 8-12 \mu$ (collected as was the type, on rabbit dung. M A C)

Insocia Rab. ; Grev. & Neave. Common on dung, M A C

Psouage adulara Grev. On horse dung. M A C. Aves 44 spores. Differs from type in that the spores are smaller being $19-21 \times 11-13 \mu$.

albicans A. & N. ; Grev. (*P. saprophila* Fr.) Kar. ; On horse dung

(n) **auraria** (Des. Kuntze. On horse dung. M A C

collapsa Grev. Common on dung of rabbit and goat

cinerea Fiedl. ; Grev. & Neave. On dung of rabbit and goat, M A C

- **curvicola** (Wint.) Kuntze. On dung of sheep and goat, M A C

- **decipiens** (Wint.) Kuntze. On horse dung. M A C

- **heterochaeta** Grev. On horse dung. M A C. Aves 16 spores. spores $30-32 \times 16-18 \mu$.

minuta (Fiedl.) Kuntze. On old dung, M A C

monilata Grev. On dung of horse and goat. M A C

tetraspora Wint. ; Grev. On rabbit dung. M A C

viridis Zopf. ; Grev. On dung of horse and goat, M A C

Sporormia corymbospora Nuss. On horse dung, M A C. Spores 8 celled, third cell larger. $45-52 \times 8-9 \mu$

intermedia Auerw. On cow dung. M A C

lutea Grev. On rabbit dung. M A C. $44-50 \times 17-20 \mu$.

hypocina Nussl. On rabbit dung. M A C. $28-35 \times 5-8 \mu$

(n) **leptosphaerioides** Speg. On old pure pots. M A C. Another species with 8 celled spores, on same substratum

magalospora Auerw. On cow dung. M A C

(n) **maxima** Auerw. On dung of cow and rabbit. M A C

tuberculata Grev. On rabbit dung. M A C

Sphaeriaceae

Acanthostigma anagae (A. & P.) Ph. On old pure wood, Keweenaw

Bartia acutiformis (Tode.) de Not. On asclep. Norway House

Bortella (n) **botryosa** Morg. On rotten wood, M A C. Aves 70-80 \times 7-8 μ , spores 1-septate, $23-34 \times 3-4 \mu$

Chaetosphaeria (n) **strobilata** (A. & R.) Bacc. On old poplar. M A C

Leptosphaeria cinerea (Pers.) Karst. On dead Cornus, M A C

Lactophloeus hirsuta (Fr.) Ces. & de Not. Common on Acer, Populus, Salix, M.A.C.

hispidus (Tode) Fekl. On old poplar, M.A.C.

ovatus (Pers.) Ces. & de Not. Old Salix and Populus, M.A.C.

- **spermoides** (Hoß.) Fekl. On rotten poplar, M.A.C.

striatus (A. & S.) Sacc. On old wood, M.A.C.

- **sublanosus** (Che.) E. & E. On decaying wood, M.A.C.

viridicoma (C. & P.) Sacc. = *Lophostichus viridicoma* (C. & P.) Raulf. On old wood, Victoria Beach.

Melanomma pulvis-pyrus (Pers.) Fekl. Reported by Chownman (1908) from Elm Park, Waukegan.

Melanomma subasciculata (Schw.) E. & E. (for a variety, the spores being $34-36 \times 8-10 \mu$). On old *Pinus resinosa*, M.A.C.

Rosellinia lignaria (Grev.) Sacc. On Prunus and Quercus, M.A.C., Birds H.I.

mammiformis (Pers.) Sacc. On dead Cornus, M.A.C.

- **medullaris** (Walr.) Ces. & de Not. Old wood, M.A.C.

- **parasitica** E. & E. On Symphoricarpos and Populus, M.A.C.

subcompressa E. & E. Old wood, M.A.C.

Ceratostomataceae

Ceratostoma brevirostre (Fr.) Sacc. Old Populus, M.A.C. $14-16 \times 4 \mu$.

Cucurbitariaceae

Cucurbitaria Berberidis (Pers.) Gray. Common at M.A.C. on *Berberis vulgaris* and *B. Thunbergii*.

elongata (Fr.) Grev. Common on Amorphus (C. Amorphus), Canoga Park (Cottonwood), M.A.C. *Camarosporium* usually associated.

Othia hypoxylodes E. & E. On decayed wood, M.A.C.

Amphispheeriacae

Amphispheeria (n) **albomaculans** (Schw.) Ces. On white areas on old wood, M.A.C. Spores $8-14 \times 4-6 \mu$.

applanata Che. Common on outer bark of oak trees, M.A.C.

- (n. **hispida**) (C. & E.) Sacc. On old poplar bark, M.A.C. Similar to *Fungi Columb. 1818*.

Trichospora clavipora E. & E. On old Acer Negundo, M.A.C.

- **inactura** (Ell.) E. & E. A form on Prunus; M.A.C. $16-23 \times 8-11 \mu$.

- Teliospora maparlega** E & E. On dead Salix, M A C
Like the next, but larger throughout.
- obducta** (Fr) Fekl. On old elm and oak twigs, M A C
- **populina** E & E. On decorticated poplar, M A C
T. kanense and *T. populina* are very similar
- graniformis** N₃. On Populus, M A C. Very similar to the three next used in the last entry although *T. prunifera* has larger perithecia
- (n) **pyramis** E & E. On poplar, M A C. Perhaps a small form of one of the preceding

Lophiostomataceae

- Lophiostoma pulveracea** Sacc. On old board, M A C
- Lophiostoma Arundinis** (Fr) (ex. & de Not. On old Phragmites, Lake Dauphin.
- **erecta** E & E. On Salix, M A C, h k board
- **quadrinucleatum** Karst. On old Acer, M A C. This species may be only a form of *L. triaplatum*
- **mononucleatum** Cke. On Salix, M A C
- **triaplatum** Pk. Very common on old wood of deciduous trees.
- vestitum** Pk. On old poplar, M A C

Mycosphaerellaceae

- Mycosphaerella Chinensis** E & E) Deurn. On C. umbellata & other Deurn. Spores 12-12 x 2.5-3 μ
- Fraxinae** (Pk) Lév. On strawberry *Rumicaria Tularensis* the conical stage is common
- rubra** (Pk) Jacc. Causes Gray bark. The conical stage is fairly common on raspberry stems
- Thalictri** E & E. On *T. dioicum*, M A C
- Mycosphaerulina bristiana** Pe. On alfalfa, Brandon

Pileoperiaceae

- Caricopersa manitobensis** Deurnea and Bask. Perithecia scattered, erumpent, sometimes only the short-beaked setaceous valves through a rift of the bark seated on the cortex, black, indurated, 175-190 μ in diameter. Asci sacculate cylindric, curved, to fit the globose mass, adnate to the base of the perithecia on central axes sub clavate, all short-stipitate, 70-85 x 12-21 μ with sp. up to 15 x 4 μ . Immature asci thick walled, the immature apex up to 15 μ thick paraphysate. Spores 2-4 seriate, each with 4-6 fuliginous brown cells and an acute, hyaline cusp at each end lacking a setal prolongation

Leptosphæria pyrenopezizoides Sacc & Speg. On herbaceous stems at Victoria Beach, and a form on old weathered wood at Birds Hill.

Leptosphæria rugosa Desmaz. and Bask. n. sp. Perithecia scattered throughout, raising the surface into pustules which are soft exposing the large, shallow, often, variable cells and the rugose surface seated on the sides sometimes in a very narrow band and usually about 0.5 mm. in diameter. Ascomata only varying in shape usually of broadly elliptic 115-140 x 11-15 μ . brown papillate. Spores 10-13 septate, restricted at all the septa, one or both ends sometimes sub acute at other times rounded, somewhat obliquely striated with lacunae 18-27 x 8 μ .

On dead stems of *Cornus alternifolia* M. A. C., Winnipeg, May 4, 1926 (J. J. D. 287). The imperfectly described *L. alternans* B. & C., Sacc and *L. pilosipes* Sacc may not be different. Further material is needed to determine this. Related to *L. rugulata*.

Leptospira (L. & P.) Sacc. On old *Rubus* M. A. C.

Elaphoglossa californica (Th. & Hark.) Sacc. On *L. alternans pilosipes* M. A. C.

Aspilota F. & Hark. This fine species is common on bark 4-5 mm. M. A. C. Spores 3 septate 75-24 x 10-13 μ .

Aspilota Sacc & Speg. Sacc. (H. C. Sacc.) M. A. C.

Dothidea Harkn. Common on living leaves of *Stachys herbacea*. M. A. C.

- (n) **Aspilota** Sacc. On old stems M. A. C. I. L. C. Sacc.

Aspilota F. Sacc. On old *Pyrus* Wilson. Sacc. M. A. C.

Elaphoglossa quercus Desmaz. and Bask. n. sp. Perithecia rather as *Elaphoglossa* immersed in the cortex or throughout in almost superficial in the bark and 0.3-0.4 mm. in diameter 0.2-0.25 mm. deep, upon large papillate. Ascomata elliptic 2 septate 80-120 x 13 μ . papillate numerous, each enclosing the asc. Spores 4-5 septate usually with a large gutta in each of 74-30 x 8-8 μ . The dead description of *quercus macrocarpa* M. A. C. Winnipeg, Mar 10, 1927 288 (D. 288).

Opisthoxylum arundinis (Sacc.) Duby. On old *Castilleja canadensis* near Hudson.

Cyathostoma **triplex** (H. & P.) Rave. (Common on old stables and
other buildings. Frequent. N. & S. America.)

proportion was 10 percent, a value generally consistent with the 10 percent figure reported in the literature.

polypropylene 7.40 5000 (20 days) average of 4 attempts
polypropylene 7.40 5000

Physiographic description The watershed of the Irving River is located in the northern part of the county. It is a small, steep, and rugged mountain range. The highest peak is at the north end of the range, and the river flows southward from this point. The river is a small, clear, and fast-moving stream. It is surrounded by a dense forest of evergreen trees. The river is a popular spot for fishing and hiking. The river is a beautiful and scenic area. The river is a great place to spend a day. The river is a great place to spend a day. The river is a great place to spend a day.

[illegible]

M.A.C., Baya Hill, St. Norbert.

Psychology, Bachelor of Science 1 Year 1 Fall 2nd semester 3rd 4th 5th

[illegible]

Posterior segments of antennae with broad bases of
 segments 1-3, segments 4-6 gradually decreasing in size, segments 7-10

[illegible]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	52
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Discussion P & B: The young larvae of *Leucodermes* present a new record for the state of Minas Gerais.

Journal: *Journal of Polymer Science: Part A: Polymer Chemistry*

100

Parameter	Value	Unit	Reference	Notes
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Phenylurea P & K von Schöppner, Harns & Harns. Die
Verweise auf *Phenylurea* (Schöppner) Harns & Harns.

Monaria Pyri Oth. On *Amelanchier alnifolia*, M & C
var. hirsuta B & C on *Amelanchier*, M & C

Monariella Curryi (Tul.) Sacc. This fine species is common
 in Tul. twigs at M & C. The *Sphaeropsis* stage,
N. olivacea (Oth.) is also present.

Puccinimaria n. *sp.* (B & H) Sacc. On twigs of
Amorpha, M & C.

Gymnosperms

Gymnospora albae (Schw.) Thorel. Common on leaves of alba,
 M & C.

Gymnosporia Coryli (Harkn.) Sacc. Abundant on hazel leaves,
 Huron River Victoria Beach, M & C.

Coryli var. *carolinensis* Desmazz. and Raby n. sp. Differs
 from the usual form in the curvature of the perithecia,
 the smaller spores, and the more strongly developed
pseudostromata. On leaves of *Corylus rostrata*, M & C.
 Winnipeg Aug. 8, 1929. 2241 (D. C. M.)

Valeraceae

Arthonia adnatum (C. & P.) Sacc. Dead twigs, M & C.

Disperthe albocaulis K. & K. Common on Cornus branches,
 M & C.

(n. *micromata* (H.) Sacc. On *Amelanchier*, M & C.

araneola Nits. (D. *canadensis* K. & H.) On Cornus,
 M & C.

oblonga Sacc. On *Amorpha fruticosa*, M & C.

sticticostoma (Fl.) K. & K. On *Crataegus*, and a form on
Prunus in which the stroma reaches the wood but does
 not penetrate it, M & C.

fulgida Fr. Sacc. On *Quercus* twigs, M & C.

(n. *bristicha* de Not. On *Pinus strobus*, M & C.

Disperthe Viburni Desmazz. and Raby n. sp. Stroma cortical,
 thickly matted, one or two sometimes even three in a
 row, marked by clusters of 2 or 3 seldom 4 or 5 shining
 black cylindrical ostia, perpendicular rows with or rising at
 most barely 100 μ above the underlying cuticle, reaching
 the wood but not penetrating it, coming off with the
 lustrous bark 0.5 mm. acc. on the base 0.2 or 0.3 mm. high,
 not circumscribed by a dark line nor darkening the under-
 lying wood. Perithecia 2-5 horizontal broadly elliptical in
 section 150 μ wide 150 μ high ostia emerging in a closely
 set group. Awa uniserial long fusoid, 48-66 : 10-14 μ ,
 paraphyses not seen. Spores 2-ranked, 2-ranked in the
 middle of the sacus, hyaline, 1-septate, septum distinct,

rounded at the ends, widest at the middle, not constricted
 $15-18 \times 4-5-8\mu$ wall evident $0.5-1-2\mu$ thick. (On
Lithium *Leconte*, M. A. C. Winnipeg April 18 1896
 2637a (D. 6048).

Disporthea viburnacea Waters, et al. det. On *Lithium* *Opulm*
 M. A. C. The specimen lacks the black strutting line of *D.*
Berkmanii N. Fr. on the same host. Spores $15 \times 3-4\mu$.

Entype Achari det. On old poplar and willow. M. A. C.

Savoryaceae H. B. Sacc. (*Phaeospora* *Savoryana* Fr.). On
 old barrel stave, M. A. C.

Isa Pers. f. det. On *Salix* and *Populus*. M. A. C.

Isidionda Sacc. On *Acer* and *Prunus*. M. A. C.

millaria f. Sacc. On *Lithium* *Leconte*. M. A. C.

Ectypella angulosa Nyls. On old wood. Keweenaw.

curvicauda Fr. & Sacc. On old wood. Keweenaw.

nitida Nyls. det. On *Prunus*. M. A. C.

Pezizella asperula B. & E. On oak. M. A. C.

phaeospora Sacc. Common on *Populus*, occasionally on
Acer. M. A. C. The perithecia are sometimes single and
 rough, then be mistaken for a *Karstenella*.

princeps f. det. On oak and *Lilia*. M. A. C.

in vestita f. Sacc. On poplar. M. A. C.

Thyridium ambustum V. & E. Sacc. On rim, with a *Macro-*
dipodia, M. A. C.

in antiquum f. & E. Sacc. On *Prunus* and *Ribes*. M. A. C.

condensum f. & E. On old *Crataegus*. M. A. C.

Talos umbona Pers. Fr. Common on *Amygdalus*, *Cornus*,
Cornus, *Cornus*, *Cornus*, *Cornus*, *Cornus*, *Cornus*, *Cornus*,
Quercus, *Rosa*, *Salix*, *Lamaria*, *Liriod.*, *Viburnum*,
 M. A. C. Several *Heucl.* *Heucl.* *Heucl.* *Heucl.* *Heucl.*
 names of this fungus have been named, but these names
 mean little. Very commonly 8 spores but often with only
 4 large spores.

torrida Pers. det. On *Salix*, *humbata*. M. A. C.

cinerea Fr. On *Prunus*. M. A. C.

— **cornea** f. det. On *Cornus* *ambigua*. M. A. C. $14-17 \times 3-5\mu$. An associated *Cytospora* has spores about $8 \times 2\mu$.

cornea (H. B. f.) Fr. On *Cornus*. M. A. C. $8-9 \times 1-1.5\mu$.

brachia f. det. On oak. M. A. C. Considered by Ellis &
 Imberhart (p. 48) as a large spored form of *C. prun.*
 Our specimens had spores $14-20 \times 3-5\mu$. The associated
Cytospora had spores $4-6 \times 1\mu$.

— **laevigata** (Pers.) Nyls. Common on *Amelanchier*, *Cornus*,
Cornus, *Cornus*. M. A. C. An associated *Cytospora* with
 reddish heads had spores $4-7 \times 2\mu$.

- Valsa leucostomoides** Fr. The spores smaller than in type, 10-12 \times 2 μ . On *Corylus*. M. A. C.
alva (Hoff.) Fr. Common on bark of poplars, M. A. C.,
 Variegated Hazel.
- pallida F. & E. On *Salix* (rust); M. A. C. An associated
 (yet up to this spores 5-7 \times 1-3 μ).
silicosa (Pers.) Fr. On willow branches, M. A. C.
Symphoricarpi Rehm. M. A. C. Externally different from
F. anthonii but similar internally.
translucens de Not. On bark of *Salix* and *Populus*, M. A. C.
Valsa Laschii Nitz. On *Prunus* *Rouge*, *canadensis* also present,
 M. A. C. (See *Myologia* 14: 252).

Melanconidaceae

- Cryptosporia basicola** V. & E.; Sacc. Or a form of it on
Amelanchier. M. A. C.
- populi Pers.; Sacc. On poplar branches, M. A. C.
Cryptosporia Calcepora Kautsky F. & E. On *Symphoricarpi*
 carpos, M. A. C. 17-25 \times 9-10 μ .
Cryptosporia Lentaginis Rehm. On *Valeriana*, M. A. C.
Melanconium occulta F. ex. On poplar branch, M. A. C.
Valsa laetitia V. & de Not. On oak and poplar. M. A. C.
serotina (F. & P.) Sacc. On alder branches. Norway
 House.

Dialypaceae

- Dialypa allopruinosa** Rehm; Che. Common on *Corylus*
 occasional on *Prunus*, M. A. C.
allopruinosa var. *salicina* Rehm. On *Salix*. M. A. C.
 in *asterostoma* B. & C. On *Valeriana* and *Salix*. M. A. C.
 7-9 \times 3 μ .
Dialypa Calcei Desmaz. and Huby, n. sp. *Sitostoma*
 scattered, sometimes several confluent elongated and
 encircled by the apothecia or lifting it free from the
 cortex, seated in the cortex and lengthening it if it not
 thickening the wood. Flat perithecia of rows or some-
 times water in the upper half. 1-4 mm. diam. 1-2 mm.
 high. In wood on the surface white with a *Perithecia*
monostrophus 5-20 in a stroma raised 0.5 mm. high with
 cylindrical necks 0.5 mm. long. Ostiole variable some-
 times nearly entire often minute and pyramidal not
 prominent. Area long stipitate about 100 μ long spore
 bearing portion 40-45 \times 8 μ paraphyses abundant
 reaching a length of 170 μ . Spores subconical, slightly
 curved, yellow-brown, obtuse. 11-13 (15 \times 7-8 μ .
 On leaf stems of *Calcearia canadensis*. M. A. C., Winnipeg.

April 17, 1937. 3724 (D. 5472) Approaches *D. bulbosa* (Hoff) Fr

Diastype bochebicus E. & E. Old elm and box-elder, M.A.C.
— **stigma** (Hoff) de Not. Exceedingly common on Amelanchier, Betula, Crataegus, Prunus, Pyrus, Rosa, Quercus, Salix. Two forms of this fungus are to be found (depending perhaps upon the nature of the cortex of the host) one with stromatic outgrowths which push up the bark, found on oak, and also on apple, the other on other hosts, lacking these outgrowths. Norway House, Victoria Beach, M.A.C.

— **lunata** E. & E. A form on Amurpha with somewhat smaller stromata than in the type. M.A.C.

Diastypella decorata Nits. Common on birch, Norway House, M.A.C., Indian Bay, Kenora.

— **discoidea** C & P, a form on Falsusvet Opulid, M.A.C.

— **Frutit** Fr. On Corylus sterna, M.A.C.

irregularis C & E. Possibly a form of *D. verrucosiformis*. On Pyrus, M.A.C.

— **miscellaneous** E. & E. Common on Corylus, M.A.C.

— **quercina** Pers. On Amelanchier and Crataegus, M.A.C.

— **verrucosiformis** (Ehr) Nits. On Prunus, M.A.C.

Malosporumataceae

Botryosphaeria fuliginosa (M & N) E. & E. (as the name is used by Ellis). On Fraxinus, Prunus, and Vitis, M.A.C.
A Haplosporilla stage on Prunus has spores $15-24 \times 9-12\mu$.

Xylariaceae

Daldinia concentrica (Bolt.) Ces. & de Not. Common on old wood, especially after fire.

— **versicolor** (Schw) Ces. & de Not. Less common than preceding, M.A.C., Norway House.

Hypoxylon commutatum Nits. Bark of poplar, M.A.C., Kenora.

— **crustaceum** Nits. On decaying poplar wood, M.A.C.

luscopurpureum (Schw) Berk. On Tilia, M.A.C.

lucens (Pers.) Fr. On hazel, birch, etc., Norway House, M.A.C., Kenora.

— **Morus** B. & C. On poplar, willow, alder, M.A.C., Valley River, Kenora. On Pyrus and Cotoneaster at M.A.C. there are outgrowths comparable to *Institale acarifera* Fr.

— **multiformis** Fr. Common on birch: Norway House, Victoria Beach.

- Hypoxyton pruinatum** (Klotz.) Che. *H. Holmiae* R.H. Common as a parasite and saprophyte on poplars, M.A.C.
 - **rufiginosum** (Pers.) Fr. Common and conspicuous on old decaying wood Winnipeg, M.A.C.
 - **serpens** Fr. On a stump, M.A.C.
Humularia repanda (Fr.) Nyl. Not uncommon on elm, M.A.C.
Xylaria acuta Pk. At base of stumps and on old Salix, Lamb. corner-damask Scher. Berk. Common on old wood, Munk, Victoria Beach.
Hypoxyton f. *lutes*. Old wood, M.A.C.

LABOULBENIALES

- Laboulbenia Gyrindarum** Thaxter. On elytra of *Gyrinus luteus* Winnipeg. Collected by J. H. Wallis, identified by H. J. Brodie.

BAUDINIACEAE

- Sporobolomyces albus** W. F. Hanna n. sp. A yeast like organism producing colonies white at first then creamy, white and finally scabed yellowish when grown on nutrient agar. Multiples in buds by budding. Vegetative cells mononucleate, 2.7-10.8 \times 2.2-5.4 μ , mean 6.2 \times 4.5 μ . Short sterigmata are developed from cells at the surface of the colony, each bearing at its tip a mononucleate spore which at maturity is violently discharged into the air. Spores 4.3-6 \times 3.4-8 μ , mean 5.5 \times 4.5 μ .

Obtained repeatedly from rusted wheat and oat straw. The original cultures were secured from straw collected at M.A.C. in October 1928 and dried then mounted in November as I placed in a damp chamber over agar at the Dominion Rust Research Laboratory at Winnipeg. Spores were discharged from the straw etc. (el. upon the medium from which pure cultures were obtained). Subcultures have been sent to the Centraalbureau at Baarn, Holland, and to the American Type Culture Collection at Chicago.

- **roseus** Kuyver & van Nij. Colonies pink in culture. Cells 11.8-13.6 μ long by 4.3-5.4 μ wide. Spores violently discharged from sterigmata mean size 10 \times 5 μ . Obtained as was *S. albus* from rusted wheat and oat straw in a damp-chamber by Dr. Hanna at the Rust Research Laboratory.

USTILAGINALES

- Claviceps Clavica* (Pers.) Magn. On *C. varia* at Victoria Beach, common on *C. squarrosa* at Norway House.
- Douglasii Akinetis* Nava. (Corn) On *Alopecurus subcordatus*; Dauphin, Poplar Point, M.A.C.
- *deformans* Neta. On Sagittaria, Victoria Beach, M.A.C.
- (n) *furva* Davis. On Sagittaria. M.A.C.
- intermedia* Neta. On Sagittaria, Victoria Beach.
- ranunculosa* Davis. On *Ranunculus delphinifolius*, Birds Hill. This smut is apparently rare.
- Erysima Achillaeae* P. Magn. On *A. millefolium*, M.A.C., Aug. 5, 1928, and apparently also at Minaki and Norway House. The first known American record. Conidia 13-20 x 3-6 μ .
- *australe* Speng. On *Physalis* and *Solanum*, Melbourne, Birtle, Virden.
- compositarum* Farl. On *Aster*, *Ambrosia*, *Agoseris*, Morris, Roston, I. L. Connors and W. L. Gordon.
- *Maculipetal* Farl. & Trel. (common on *M. canadense*, M.A.C.)
- polysporum* Pk. Farl. On *Gallardia*, M.A.C.
- Ranunculi* (Bon.) Rehr. On *R. Macdonaldii*, Dawson River, Victoria Beach.
- *Thalictri* Schroet. On *T. discolor*, Roston, Dauphin, M.A.C.
- Sporisorium Paniculi-millicolae* (Pers.) Taka. Sometimes injurious, M.A.C., Koyan.
- Sphaerolotheca occidentalis* (Seym.) Clark. On *Andropogon*; Binacarth, Omaha.
- Sorghii* Clark. Clark. On *Holcus Sorghum*, M.A.C.
- Tilletia horrida* Kuehn. Not uncommon on *Trisetum aestivum*.
- Tilletia Bjerk.* Wint. Waterweed and injurious on durum wherever grown and also on bread wheats in the northern areas of Manitoba (I. L. Connors). Occasionally results in destruction of threshing machines from spontaneous combustion of the oily spores. Seed treatment fairly common.
- Troosia Lemnae* (Beck.) Syd. On *Sparganium*, Winnipeg.
- Urocystis Agropyri* (Pers.) Schroet. Reported from Brandon.
- Agropyris* (Pers.) Wint. On *Poa*, Morden, Brandon.
- Cepulae* Frost. Found on onion in 1922, 1924, and 1926 at Winnipeg.
- *occulta* (Wallr.) Rab. On rye, rare in Manitoba.
- Ustilago avenae* (J. Kunze) Wint. On anthers of *Triticum*, Minaki.
- *Avenae* (Pers.) Jena. Often injurious to oats.

Ustilago bromivora (Tul.) Bask. (cf. W. P. Fraser). Common on *Agropyron tenerum*.

On *gracilis* Fr. or *U. maculata* Sacc. may be the start of which a little was found on *Phragmites* at Delta by V. W. Jackson.

Ustilago Fr. K. & S. on *Syntherisma*. Often injurious to barley, *hypodryas* Sch. Fr. On *Stipa*, *Trinobasis*, *Rapet City*, *Irish* & A. N. M. on *Ustilago* on *Ustilago*.

Ustilago Fr. on *Hordeum jubatum* everywhere, sometimes abundant.

Ustilago Fr. on *Hordeum jubatum* everywhere.

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UREDINALES not being records from Fraser and Connors, *Trinobasis* & *Ustilago* 10 178 1000.

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- Melampsora Sigelowii** Thum. I (?) on Larix, Birds Hill; III on willow everywhere.
- **Humboldtiana** Speg. On *Salix cordata* (N. A. Flora, ? 600).
- Lin** (Schum.) Desm. On *Lonicera Linearis*, Balguy, Russell, widespread and sometimes injurious to cultivated flax.
- **Medusae** Thum. II, III, common on poplars, M.A.C. westward.
- Melampsoridium Betulae** (Schum.) Arth. On birch, Treesbank, E. Criddle.
- Melampsorella elatiae** (A. & S.) Arth. On *Cerastium*, Brandon, W. P. Fraser.
- Melampsorella abietina** (A. & S.) Arth. On *Ledum*, Kenora, *ledicola* (Pk.) Arth. II, III, on *Ledum*, I on *Picea*, Norway House, Minsk.
- Pyrolae** (DC.) Arth. On species of *Pyrola*, Victoria Beach, M.A.C., and west.
- Nyctopora clavuligera** (Beck.) Arth. On *Aralia*, Norway House, St. Marys River to M.A.C. and Minsk.
- Peridermium coloradense** (Diet.) Arth. Causes large witches' brooms on spruce, Victoria Beach to Norway House and Brandon.
- Phragmidium Andersoni** Shear. On *Potentilla*, M.A.C.
- pusillum** (Tode) James. On cultivated rose, M.A.C.
- imitans** Arth. On *Rubus*, Brandon, Treesbank.
- vestiae** Syd. On *Potentilla*, Brandon, Virden.
- **montivagum** Arth. On *Rosa*, Morris west to Virden.
- **Potentillae** (Pers.) Karst. On *Potentilla* and *Sibbaldopsis* everywhere.
- Rosea-acicularis** Laro. On *Rosa acicularis*; Norway House.
- Pileolaria Texedendri** (H. & Rav.) Arth. Winnipeg to Brandon.
- Polythelia suffusa** (Holw.) Arth. On *Pulsatilla*, Treesbank to Virden.
- Thalictri** (Rav.) Arth. On *Thalictum* sp., Winnipeg, M.A.C.
- Puccinia Abiesii** DC. On *Artemisia*, Kenora, M.A.C., Dauphin.
- abundans** (Pk.) Jacks. On *Symphoricarpos*, M.A.C. to Russell.
- **amphigena** Diet. On *Erigeron* and *Calamagrostis*, Birds Hill to Binacarth.
- Andropogonis** Schw. I on *Comandra* and *Pentstemon*, II, III, on *Schizachyrium*, Birds Hill to Morden and Binacarth.

Puccinia Angelliana (Schum.) Frick. On *Luzula*, Killarney, Brandon.

angustula Fr. I on *Monarda*, II, III, on *Scirpus*, Brandon, Manitoba.

— ***anemone*** Reute. On barley first found in 1922 common 1927.

— ***Antennaria*** D. & H. On anagallis at Winnipeg in 1919, in the greenhouse at M.A.C. in March 1920, injurious since, Winnipeg to Boston.

— ***apocrypha*** H. & Tracy. On *Onosmodium*, Treeshank, E. Griddle.

Asperagi H. Sometimes *argyræa*, Morden to Brandon and M.A.C.

— ***Asteris*** Duby. On wild asters, Manitoba, Brandon to Virden.

Asterum Schum. & Kern. I on *Aster cordifolius*, Neudago, II, III on *Carex comans* (near Winnipeg westward).

— ***Berberis*** C. & G. On *Aster* var. Winnipeg, D. L. Hickey.

— ***Carlisle-Shepherdianæ*** Davis & Allen (Can.). On *Elaeagnus* and *Lepargyrea*, Sturminster, Brandon. Gilbert Plains. Identifications by W. P. Fraser.

— ***calthacola*** Schum. On *Caltha*, Dauphin, W. P. Fraser.

— ***Clavica*** Lach. On *C. maculata*, Brandon, W. P. Fraser.

Cirsium Pers. On *C. alpinum*, Victoria Beach, Norway House.

— ***Clavica*** Lach. On *Cirsium*, Brandon, Treeshank, Hurtle.

— ***Clematidis*** (D.) Lach. I on *Actaea*, *Anemone Thalictrum*, II, III on *Agropyron Bromus Elymus Hordeum*, Poa, widespread.

— ***Comandra*** Fr. On *C. lyallii*, Norway House.

— ***Convolvuli*** (Pers.) Cest. On *C. sepium*, Neepawa, R. C. Ramey.

coronata Cda. (P. Rhemati). I on *Eragrostis Lepargyrea*, *Rhynchos*, II, III on *Avena*, *Horkmaria*, *Bromus*, *Calamagrostis*, *Scutellaria*, widespread often injurious to oats.

Cyperus E. & H. Common but not serious, on rye.

— ***Distichidis*** E. & H. I on *Stenactis*, II, III, on *Spartina*, M.A.C. westward.

— ***Echinochloæ*** Arth. I on *Eupatorium*, II, III, on *Echinochloa* (*N.A. Flora*, 7: 347).

— ***Elliptica*** Thum. I on *Vicia*, II, III, on *Andropogon*; Winnipeg and Treeshank.

— ***emissa*** Kern. On *Carex diaphana* (*N.A. Flora*, 7: 345).

— ***eriantha*** (Lach.) Arth. I on ash, M.A.C.

— ***gigantea*** Kern. On *Chamaecrista*, Norway House.

- Psocinia granulata* Pers.** I on *Berberis vulgaris*, II, III, on *Agropyron*, *Agrostis*, *Alpecurus*, *Avena Beckmannia*, *Brom.*, *Plant.*, *Elymus*, *Festuca*, *Hordeum*, *Koeleria*, *Lagurus*, *Phalaris*, *Platan*, *Sesale*, *Sporobolus*, *Torrens*, *Triticum*. See Host Index for species of hosts, Bibliography and Sections V and XII for general references to this destructive rust.
- ***Orizolalia* Pk.** On *Lycopodium*, western Manitoba, W. P. Fraser, L. Criddle.
- Cronotaria* Schum.** Iagh. I on *Crossolana* and *Ribes*, Norway House and southward.
- Ralegia* A. & H.** On *Gentiana*, Manak.
- Heliantho-mellis* (Schw.) Jacks.** On sunflowers, Norway House and southward.
- Leptopharia* (Pk.) E. & E.** On *Lactuca*, common, Winnipeg westward.
- ***Hemicharax* (Schw.) Diet.** On *Hemicharax Richardsonii*, Motel & Norway House, Gurni, Treesbank.
- Mercuria* Schw.** Jacks. I on *Hieracium*, *Lactuca*, *Nabulus* II, III on *Carex*, Swan River, M. A. C., Morris, Brandon, etc.
- Hieracii* Schum.** Mart. On *Hieracium scabraeforme* and *dandelion*, Treesbank, M. A. C., Gilbert Plains, Norway House.
- Impatiens* (Schw.) Arth.** I on *Impatiens bifida* at Swan River, Big Buck River, Dauphin, II, III on *Hordeum*, and cultured by W. P. Fraser on *Elymus*, at Brandon.
- ***Liabridia* (L. & A.) Beth.** I on *Laminaria* at Birds Hill, III on *Agrostis* at Treesbank, L. Criddle.
- Linkii* Kuotr.** On *Lobelia pumila*, Norway House.
- Lychnachia* (Link.) Korr.** I on *Nautilopsis*, Norway House.
- Magnusiana* Kuern.** On *Phragmites*, Dauphin, W. P. Fraser.
- Majanthus* (Schum.) Arth.** I on *Iris*, *Unifolium*, *Vagneri*, and II, III on *Pharus*, Victoria Beach, Swan River, M. A. C. to Brandon.
- ***Malvacearum* Diet.** Reported from Winnipeg on holly hock, one doubtful specimen on *Malva*.
- Marylandica* Laidl.** On *Ranunculus*, Winnipeg to Brandon.
- Menthae* Pers.** On *Mentha glabra* and *Monarda*, Grand Beach to Swan River and Waskada to M. A. C.
- ***millifolia* Fekl.** On *Achillea*, Carberry to Robur, W. L. Gordon and W. F. Hagborg.
- ***monilia* (Pk.) Arth.** I on *Arabis*, II, III on *Trisetum*, Treesbank, Le Pae.

- Psocidia montana*** Ell. On Agropyron and Elymus.
Brandon and Dauphin, W. P. Fraser
- opata*** Arth. & Hov. On Rumex. Glenora, W. Popp
- Peckia*** (de T.) Kell. I on Menoxia i Oenothera, II, III,
on Carex. M. A. C. to Treeshank and Brandon.
- Physalis*** Pk. On Physalis, Treeshank, E. Criddle.
- Pimpinellae*** (Strauss) Mart. On Oenothera, Winnipeg.
M. A. C.
- ***Poa*** Nuss. On blue grass, Norway House southward.
- ***Polygonum-amphibol*** Pres. On Enderdykka, Petawaka, and
Polypodium, Victoria Beach to Swan River, and M. A. C.
to Yirden.
- ***porphyrogemila*** Curt. On Cornus, Norway House, Victoria
Beach.
- punctata*** Link. On Galium, Norway House, Treeshank
Khamu. See *P. coronata*.
- ***Ribes*** DC. On Ribes, Victoria Beach, W. L. Gordon.
- ***rubefaciens*** Johans. On Galium, Norway House, Assin-
boya Kallaway.
- rubella*** (Pers.) Arth. I on Rumex, II, III on Phragmites,
Dauphin, Treeshank, W. P. Fraser, E. Criddle.
- ***Sclerodiana*** Koern. On Malvastrum, western Manitoba.
- ***Sorghu*** Schwe. On maize, M. A. C. to Brandon. Not
injurious.
- Stipa*** Opiz.) Arth. On Stipa, western Manitoba, W. P.
Fraser.
- ***subtilis*** Diet. III on Dactylis, western boundary.
- subterilis*** E. & E. On Stipa, Winnipeg and west.
- trifida*** Link. Common, sometimes injurious, on wheat.
- ***troglodytes*** Lendr. On Galium, M. A. C.
- ***universalis*** Arth. I on Artemisia, II, III, on Carex,
Brandon, Treeshank, Ste. Rose.
- urticata*** (Link.) Kew. I on Urtica, II, III, on Carex,
everywhere.
- ***varia*** Pers. On Bouleaux, Treeshank, E. Criddle.
- ***Viola*** (Schreb.) DC. On Viola, Minaka, Victoria Beach,
M. A. C. west.
- Xanthi*** Schwe. On Anemone and Xanthoxum, Winnipeg,
Morris, Treeshank.
- Psocinastrum Abell-Chamaenerii*** Kleb. On Chamaenerion,
Norway House, Kenora, Treeshank.
- Agrimoniae*** (Det.) Tranz. On *A. gryosepala*, Kenora,
Victoria Beach, Treeshank.
- ***arctium*** (Lagh.) Tranz. On Rubus, Norway House,
Kenora, M. A. C. and west.

Fusicladium Epikhil Oot. On *E. adnoscum* and *Godetia*, Norway House, Victoria Beach, M.A.C., Brandon.

Pyralis Pers. (Det. On *Pyralis*, M.A.C., Treesbank.

Roztopia tompara (Des.) Lagh. A aggregate of *Puccinia* *Clavellii* *sessilis* with teliospores several-celled, on *Bromus*, *Brizola*, *Horris*, *Noopura*, W.P. Fraser.

Uredinopsis murablis (Pk.) Mag. (*Uredinopsis balsameum*). On *Abies*, Minaki.

Struthiopterydia Stroom. On *Pteris*, common at M.A.C.

Uromyces seminatus Arth. On *Spartina*, Brandon, W.P. Fraser.

Alopecuri Nym. I on *Ranunculus*, *Barb.*, *Kelwood*, *Brandon* and II, III on *Alopecurus* at Brandon, W.P. Fraser.

caryophyllinus (Schr.) Wint. On *carnation*, Brandon.

Faba Pers. de Pers. On *Lathyrus*, *Pleur.*, *Vicia*, *Swan River* to M.A.C. and *Treesbank*.

Saccus Lagh. *f. caryophyllus* (Cognat.) Holm. I, III, on *Trifolium*, M.A.C., determined by E.B. Mains.

- **Glycerhina** (Roth.) Magn. On *G. lepidota*, M.A.C. to *Swan River*.

Redysari-obscuri DC. (C. & P.) On *H. boreale*, *Manawath*, *Rapid City*.

hybrids Davis. On *sauke clover*, M.A.C. to *Kenville*.

Junci (Desm.) Tul. I on *Cirsium* and *Holanthus*, Brandon, *Vern.* II, III, on *Juncus*, *Oak Lake* to *Treesbank*, W.P. Fraser.

pergynus Hark. I on *Redbeckia*, *Dauphin*, *Dropmore*.

Polygoni (Pers.) Pk. On *P. cratum*, *P. aviculare*, M.A.C., *Morris*, *Dauphin*.

- **porous** Pk. Jack. On *Vicia*, *Windspeg*, M.A.C.

prominens DC., Lév. On *Chamaecybe*, M.A.C., *Morden*.

punctatus Webster. On *Oxytropis*, *Birtle*.

Endbeckiae Arth. & Helw. On *E. laciniata*, *Dauphin*.

Scirpi (Curt.) Burr. On *S. rufus*, *Poplar Point*.

Trifolii (Lév.) Lév. On *red and yellow clovers*, M.A.C., *Chatter*.

Trifolii-repantis (Curt.) Lév. On *white clover*, M.A.C.

Uromyces Amorphae (Curt.) Common on *Amorpha* spp., sometimes injurious to *A. fruticosa* used as a hedge, M.A.C., *Morden*, *Portage*, etc.

RUHOFIACEAE

Aricularia *Arricula-Jodae* Fr. *Victoria Beach*, *Kenora*.

TREWELLAE

Richierella spinulosa (R. & C.) Burt. This rare fungus was found on *poplar* at *Swan River*, *July*.

Eridia (n) *alba* (Lloyd) Burt On old wood, Winnipeg, Kenora.

glaucescens (Bull) Fr. "Witches' butter" is found on branches everywhere

— *rhoeas* Berk) Rea. On poplar bark, M.A.C. 10-14 x 4-8.

Naematelia nucleata (Schw) Fr. On dead wood, M.A.C.
Eridia of Burt

Sebacina calcea Pers.) Brev. On old wood, Kenora.

Tremella lutescens Pers. On wood, Norway House, M.A.C.
minuticrius Fr. On dead wood, Norway House

- *mycetophala* Pk M.A.C. Now considered part of *Collybia dryophila*.

- *reticulata* (B & C) Furl. (including *T. clavicornis* Lloyd).
On the ground in woods, M.A.C.

Tremellodon gelatinosum (Neop) Fr. Old conifers, Victoria Beach, Minaki, Kenora

Urocilia foliacea (Pers.) Bred (Eridia). Coniferous bark, Kenora.

DACTYOMYCETALES

Dactyomyces aurantius (Schw) Furl. Common everywhere on railway ties and other coniferous wood

- *deliquescentis* Harkn) Duby. On coniferous wood, M.A.C., Kenora

(n) *minor* Pk On poplar log, M.A.C.

- *palmatus* (Schw) Burt Occasional y occurs.

— *stilatus* Fr. *D. obtusius* (Pers.) Schroet). On pine wood, Ingolf

Guepinia elegans B & C On fallen *Acer Negundo*, M.A.C.

— *spathularia* (Schw) Fr. Reported from Kenora.

EXOBASIDIALES

Exobasidium Vaccinii (Yck) Wcc On leaves of blueberry, huckleberry, Azalea, Victoria Beach, Camp Hughes, Winnipeg.

AGARICALES

Thelophoraceae

Aleurodiscus amorphus (Pers) Reb. On bark, Kenora, M.A.C.

— *candidus* (Schw) Burt On old railway ties, M.A.C.

— *cutusatus* (Brev.) v H & L. Dr Burt wrote (May 4, 1931) that these were the first American specimens he had seen. On old wood, M.A.C., Sept. 2 and Oct. 16, 1930

Coniophora hymenoides (Pers) Fr. On branches, Arborg, Victoria Beach.

- Coniophora cerebella* Pers. On old wood, Kenora, Manitoba.
suffocata (Pk.) Massae. On wood, Winnipeg, M.A.C.
- Corticium albidocaryum* (Schw.) Massae. On wood, M.A.C.
arachnoideum B. & C. On poplar, etc., Norway House, M.A.C.
centrifugum (Lév.) Brev. Deciduous wood, M.A.C., Stony Mountain.
- confusum Fr. On old wood, M.A.C.
(n.) effusum (Cke. & Fl.) Fr. On fallen log, M.A.C.
galactinum (Fr.) Burt. On dead poplar, etc., M.A.C.
- livido-caryulorum Karst. On coniferous wood, Norway House.
luridum Lév. On wood, Winnipeg.
polygonatum Pers. On poplar bark, M.A.C.
radiatum Fr. On coniferous wood, Victoria Beach; the same or similar species on poplar, M.A.C.
- roseum Pers. On wood, Stony Mountain, Winnipeg, M.A.C.
rubellum Burt. (*Ann. Mo. Bot. Gard.*, 13: 232). On bark; Kiddom Park, Winnipeg.
- septentrionale Burt. (*loc. cit.*, p. 257). Type collected at M.A.C., Oct. 10, 1922.
sociatum Burt. (*loc. cit.*, p. 192). On coniferous wood; Norway House.
- vagum B. & C. On wood, Norway House. on potato stems, M.A.C.
villereum B. & C. On deciduous wood, Winnipeg, M.A.C.
vesiculatum Burt. On old wood, Sifton.
- Craterellus Cantharellus* (Schw.) Fr. Among conifers, Ingolf, Victoria Beach.
clavatus (Pers.) Fr. In coniferous woods, Victoria Beach.
- Cyphella capula* (Holmsk.) Fr. On fern frond, M.A.C.
- fasciculata* (Schw.) B. & C. On dead wood, M.A.C., Victoria Beach.
minutissima Burt. On inner bark of poplar; M.A.C., Victoria Beach.
- Tillae* (Pk.) Cke. Very common on branches of *Tilia americana*, Winnipeg, M.A.C.
(n.) villosa (Pers.) Karst. On poplar branch; M.A.C.
- Cyrtia salicina* (Fr.) Burt. (*Corticium salicinum* Fr.). Common on Salix; M.A.C., Kenora.
- Hymenochaete ladio-ferruginea* (Mont.) Lév. On fallen branches of deciduous trees, Victoria Beach, Minaki, Indian Bay.

- Peniophora gigantea** (Fr) Masson. On old wood, M.A.C.
 — **glebifera** Brev. On coniferous wood, Norway House.
incarnata (Pers.) Karst. On ash, etc., St. Norbert, M.A.C.
odontoides Burt. (Burt, loc. cit., 12: 223) On decaying frondose wood. Type collected at Swan River.
pubera Fr; Sacc. On old wood, M.A.C.
setigera (Fr) Brev. On bark, Kenora.
subsericea v. H. & L. Rare. Recorded by Burt (loc. cit., 12: 304) from Finland, Montana, and Manitoba. Frondose wood, M.A.C.
subulphorea (Karst.) v. H. & L. On conifer, Norway House.
Solania anomala (Pers.) Felt. Common on wood, Norway House, M.A.C., Kenora.
sticticula Pers. On old wood, Winnipeg, determined by G. F. Atkinson.
Strombos cinctuscosta (Schw.) Masson. On wood, common along the Red River.
taeniatum Schw. On used wood, Norway House, Winnipeg, M.A.C.
frustulatum (Pers.) Fr. On wood, not common.
 — **macrum** (Schrad.) Quen. (*S. bicolor*). Common, Kenora, M.A.C., Victoria Beach, etc.
ganapatum Fr. Common at Winnipeg and M.A.C.
 — **brevatum** (Willd.) Fr. On frondose wood, Kenora, M.A.C.
 — **ochraceo-flavum** Schw. Norway House, determined by C. H. Kauffman.
purpureum Pers. Common about Winnipeg as a saprophyte on old poplars etc. Sometimes injurious at M.A.C. and Morden on plum and apple, causing "Silver leaf".
radiale Felt. On old wood, Kenora.
rufum Fr. Abundant on poplar branches at all localities visited. Collected once at M.A.C. on Salix.
ragosinaculum B. & C. Kenora, Norway House.
veniforme B. & C. On birch and willow, Roblin, Virda, Gosh, M.A.C.
Telephora caespitosa Schw. Common on ground in woods; M.A.C.
caryophylla Schaef. Fr. In woods, Norway House.
 — **intybaea** (Pers.) Fr. In woods, Norway House, M.A.C.
 — **laciniosa** Pers. Recorded from Minak and M.A.C.
 — **multipartita** Schw. On ground in woods, M.A.C.
tyrystria (Felt.) Fr. Norway House, Victoria Beach, M.A.C.

Chromococcaceae

Colletotrichum coccineum Peck. Fr. : Concomitant on old poplar, bark, etc. M & C. (only) Maple Island, Lake Winnipeg
spumigenum Peck. Fr. : Harvested from Kamour.

Clavaria abietina Peck. On the ground, coniferous woods, Ingoif, Victoria Beach.

apiculata Fr. : The characteristic mould. Victoria Beach, Kamour.

crinita H. Sacc. Fr. : Concomitant on woods. M & C. Kamour.

crinita f. *canadensis*. Concomitant on characteristic woods. M & C.

discrepans Peck. f. *discrepans*. In coniferous woods. M & C.

flava Sacc. Fr. : In woods. Victoria Beach.

formosa Peck. Harvested on 11' height from Kamour.

formosa Peck. In woods, Kamour.

fulva Sacc. Fr. : Characteristic of characteristic woods, Norway House, Victoria Beach, Ingoif, Kamour.

on *monticola* L. On the ground, Victoria Beach.

— *Pestalotiopsis* Desm. This species, recorded by Under as *crinita* & *flava*, is one of the commonest characters of M & C. It occurs on characteristic woods of poplar etc., but also on oak where it forms a conspicuous whitening of the leaf mould.

puberula L. Fr. : In woods, Kamour, Ingoif.

puberula Peck. On the ground, Norway House.

pyralis Peck. Fr. : Fructification on ground, Victoria Beach, M.A.C., Glan, Ingoif.

serotina Peck. On the old characteristic mould. M & C. Victoria Beach, Norway House.

Pestalotiopsis rubiginosa Mont. & Fr. : Dark. On old grass leaves, M & C.

typhloclelea Peck. Dark. On the old stems of *Chamaenerium angustifolium* Peck. Norway House.

Pteris pumila Peck. Whitewash. Fr. : Yellow.

Typhloclelea Peck. Fr. : On old leaves. M & C.

gymna Fr. : Numerous large. On old leaves. M & C.

phaeotheca Peck. Fr. : Growing from orange brown to black, elevated up to 4 - 5 mm. On old needles and wood. M & C. Spores 10-12 - 6-8 μ .

Hydnaceae

Gravelaria verrucata Fr. : On old wood. M & C.

Hydnum argenteum Fr. : *Hydnum argenteum*. On poplar etc., M & C. f. *Hydnum f. discoloratum* Peck.

griseolum L. Fr. : Characteristically found growing from buried roots, Victoria Beach, Kamour.

— *marcescens* Pl. Desm. Under grass. Norway House.

- Hydnium caryophyllum* B. & C. Kildonan Park, Winnipeg.
 — *coralloides* Scop. Not uncommon on wood, Gosh, Victoria Beach, Minaki, Winnipeg.
cyathiforme Schaefl. (*H. conarium* Schulz). In coniferous woods Ingolf Norway House.
 — (n) *ferrugineum* Fr. On old wood, M.A.C.
lunatum Karst. In coniferous woods, Victoria Beach, Ingolf. Similar to *H. undulatum*, but with a bitter taste.
ferrugineum Fr. Old wood, Ingolf.
 — *laccipes* Coker. A beautiful *Hydnium* in coniferous woods, Victoria Beach.
lance-atrium Fr. On deciduous wood, Swan River, Winnipeg.
 — *limbatum* Schw. Found in Manitoba, exact locality not known.
imbricatum Fr. In woods, Ingolf, Minaki.
Kauffmani Pk. Winnipeg. See Lloyd *Myc. Notes*, 67: 114.
 — *laticolor* B. & C. On old wood, Elk Island.
mirabile Fr. Amongst conifers, Norway House.
niveum Pers. Not uncommon on old wood, M.A.C.
 — *ochraceum* Fr. On wood, Gosh, Victoria Beach, M.A.C.
 — *placorum* Duf. Not common at M.A.C.
repandum Fr. On ground in coniferous woods. Norway House Victoria Beach, Kenora.
septentrionale Fr. Winnipeg, on birch at Victoria Beach.
velutinum Fr. In woods, Ingolf, W.N. Derkes.
Micronella minutissima Pk. On bark, River Park, Winnipeg.
Odontia alutacea Fr. On wood, M.A.C.
Barbar-Jovin Wab. Fr. On old wood, Minaki.
laccata (Pers.) Fr. On decaying wood, M.A.C.
 — *limbata* Pers. On wood of poplar, etc., M.A.C., Kenora.
glauca L.H. & Lang. On deciduous wood, M.A.C.
Phlebia marismoides Fr. (*P. canabarina* Schw.) M.A.C., Kenora.
 — *strigoso-acuta* (Schw.) Lloyd. Common on fallen poplars, M.A.C. to Minaki.
Radicium orbiculare Fr. Reported on elm at Winnipeg Beach by Cheesman (51).

Polyporaceae

In collaboration with Dr I. O. Overholts

- Dactylis confragens* (Bolt.) Fr. Common on willow, etc.
 — *undulor* (Bull.) Fr. Abundant on deciduous wood everywhere.

- Favos canadensis** Klotz. Throughout the areas visited.
- Fomes applanatus** Pers. Wallr. Common and widespread.
- **conchatus** (Pers.) Gill. On *Viburnum*, M.A.C.
- **connatus** Weinm. On *Acer*. Winnipeg, M.A.C.
- **lomentarius** L.; Gill. On trees throughout our range.
- ignarius** Fr. Often growing on deciduous trees, especially poplars, and also on dead trunks.
- **ignarius** var. **nigricans** Fr. Common on trees and trunks.
- (*Trametes*) **Pinl** (Thore, Lloyd var. **Abietis** Karst. Elk Island).
- pinicola** (Schrad.) Cke. Common on conifers, Victoria Beach, Manitoba.
- pinicola**. A form on *Populus balsamifera* with whitish unvariegated pulp, M.A.C., Victoria Beach.
- pomaceus** Pers., Bag. & Gill. (*P. fulvus* (Scop.) Bess.) On *Prunus*, M.A.C., Meota.
- Rhiz** (Schum., Gill. At the base of cultivated currant, M.A.C.
- (*Trametes*) **scutellatus** (Schw.) Cke. On *Amelanchier*, *Ceanothus*, *Acer*, Kenora, M.A.C.
- Lanates abietinis** (Bull.) Fr. (or very thin *L. asporius*). Swan River.
- betulina** Fr. On larch, Gimn, Norway House, Kenora, etc.
- aspiaria** Fr. On deciduous wood everywhere.
- trabens** (Pers.) Fr. (*L. calva* Pk.) Chatter, Winnipeg, M.A.C.
- Merulius ambigua** Berk. On conifer, Indian Bay, I.T. Conners.
- confusus** Schw. On old wood, M.A.C.
- corium** Fr. On wood, Winnipeg.
- **lechymanus** (Wall.) Fr. Not common, caused \$2,000 damage to flooring in a Winnipeg orphanage.
- piceus** Fr. On alder etc., Kenora, Norway House.
- piceus** Hart. Norway House. Dr. Hart referred two collections to this species otherwise known to him only from the Pacific Coast, with the note that the hymenium configuration differs from that of the type, but the specimens agree in colour and in microscopic structure.
- **tremulosus** (Schrad.) Fr. On larch, poplar, widespread.
- Polyporus abietinus** (Dicks.) Fr. On coniferous wood, Kenora, Swan River, M.A.C.
- abietus** (Wald.) Fr. Very common, Norway House southward.
- **abietus** Pk. On deciduous wood, M.A.C.

- Polyporus albiceps** Pk. This rare species found twice at M A C
albissus (Sacc.) Fr. Collected at Minaki and Victoria
 Beach
- **strobilatus** Fr. (*P. guttulatus* Pk.) Minaki
- arcularius** Batsch Fr. On old wood in May, Canby,
 Arborg, Victoria Beach, M.A.C.
- anceps** Pk. A rare species, on old wood. Ingsoll between
botaninus Bull. On larch everywhere, obtained once on
 water at Arborg. Spore discharge interrupted by winter
- liformis** Kütz. On wood, Norway House Winnipeg
- brunneus** Pers. f. Fr. On wood. Kenora Minaki, M.A.C.
- cassius** (Schrad.) Fr. On dead wood, Norway House
- chioneus** Fr. On old poplar etc. M.A.C., Victoria Beach
- cinabarinus** (Jacq.) Fr. Canby Victoria Beach, Minaki,
 M.A.C.
- circinatus** Fr. Growing from buried wood, Victoria
 Beach
- conchifer** (Schw.) Fr. Occasional on elm, etc., Winnipeg.
- cuticularis** Bull. Collected once at Victoria Beach.
- **dichrous** Fr. Common on deciduous wood about Winnipeg
 and elsewhere.
- elegans** Bull.) Fr. Common, M.A.C., Victoria Beach,
 Swan River
- flavilobus** Karst. On cedar bark, Victoria Beach.
- fordosus** Quér. On poplar poles in a cellar, M.A.C.
- fusces** Pers. Fr. On old wood. M.A.C.
- gilvus** Fr. Not common, on Sassa, Acer, M.A.C.
- glomeratus** Pk. This interesting species was found twice
 on old poplar, M.A.C.
- hirsutus** Fr. Common on deciduous wood
- impos** Kahlb. Found at Kenora and Victoria Beach
- ovatus** Fr. This fine species is not rare on the ground in
 coniferous woods at Victoria Beach, Minaki, and Kenora
 "It is doubted that it occurs in the United States,"
 C. G. Lloyd.
- parvulus** Fr. Common everywhere. Often bears the
Ichon Calicium polyporaceum.
- peckianus** Chr. Locality uncertain, perhaps Winnipeg
- porinus** L. Fr. Common in sandy soil under conifers,
 Kenora, Victoria Beach, etc.
- placens** Fr. Common and widespread on stumps and logs.
- planellus** Murr. Not uncommon on old wood, M.A.C.,
 St. Norbert.
- **poliosorus** (Schum.) Fr. Occurs throughout our range.
- **resinaceus** (Schrad.) Fr. On old log and tree trunk, M.A.C.

- Polyporus subserotinus* Fr.** Found in two specimens at Mounds, comprising Fr. (the dried wood). M. A.
- gramineus* Berk.** Fr. Found near at Winnipeg.
- quercinus* Pers.** In two areas, first taken, Winnipeg, and M. A.
- subchartaceus* Wurtz** in form of *P. porphyreus*! Grows on poplars, M. A.
- sublucens* Peck** Fr. In two reported forms.
- lanceolatus* Fr.** Characteristic of Manitoba.
- oblongus* Fr.** Apparently there had been a forest at Longue Pointe. The large trees in the old plantation & sections of woods are indicated, are situated in the old poplars, & that you could not find along the Red River, which indicated to Fr. The poplars had been uprooted & so in the woods, but Mr. A. Charles Tremblay, forest guard this large forest had been from a settlement planted in the woods.
- Salpiformis* Berk.** Through *Lept. luteus*. Everywhere.
- subulatus* Pers.** Fr. Winnipeg. Peck's found to be white.
- urceus* Berk.** This rare species found near at Winnipeg.
- urceus* Fr.** Apparently *P. subserotinus* with specimens of M. A. growing from forest woods.
- velutinus* Fr.** This species common but *P. punctus* Fr. is common in poplars on M. A. Various Peck's names.
- versicolor* L.** Fr. Common in poplars, apparently.
- velutinus* Fr.** Grows in species at Swan River, Fishhook, and probably elsewhere in the western Manitoba, but we have been unable to find it around, or reported (Lake Winnipeg).
- up. ***Long Pointe, Man.*** Apparently the smaller but species obtained from just north of M. A. It certainly the northern *P. urceus* of North America are nearly all known, but evidence showing in the latter, unexplained reports, up the *P. urceus* but it is an obvious that would not be related to existing species. Fr. Characteristic will probably describe it.
- Poria anagoria* Berk.** In all poplar wood. M. A.
- affinis* Fr.** Common in forest poplar woods. M. A.
- lanceus* Berk.** In all the poplar bark. M. A.
- oblongus* Fr.** In a forest log. Swan River.
- conchiformis* Berk.** The Swan River. M. A. (Myco-logic, 15: 200).
- serotinus* (Fr.) Berk.** Common, Winnipeg. M. A. Swan River.

- Poria ferruginea* (Schrad.) Fr. On deciduous wood, M.A.C., St. Norbert.
- *laminata* Murr. Common on old poplar, willow, M.A.C.
- (=) *crusta* Pk. On decubous wood, M.A.C.
- prunicola* Murr. On dead branch of *Prunus*, M.A.C.
- purpurea* (Fr.) Cke. On poplar, etc., Winnipeg, M.A.C.
- *selecta* Karst. Common and evidently destructive to timbers, M.A.C., Victoria Beach, Indian Bay, Bonaventure, Pte. du Best.
- semitincta* Pk. On poplar, M.A.C.
- *vaillantii* Fr. Apparently rotting timbers; Winnipeg, M.A.C.
- *villosa* (Schw.) Cke. On willow branch, M.A.C.
- washingtonensis* Murr. M.A.C.
- Trametes hispida* Fr. Is common throughout Manitoba.
- *odorata* (Wall.) Fr. (probably the peroid form of *Leucium sepioides*). Common, Winnipeg, M.A.C., Kenora.
- *Peddi* Knoch. (form of *T. hispida*). Winnipeg, probably common.
- *serialis* Fr. On bark of conifer, Victoria Beach.
- *subrosea* Wier (*T. carnea*). Common on conifers, railway ties, etc., everywhere.
- Trogil Berk* (a form of *T. hispida*). Gumb.

Boletaceae

- Boletinus cavipes* (Opst.) Kalch. Minaki.
- *pletus* Pk. Among conifers, Birds Hill, Kenora.
- Boletus n. brevipes* Pk. In woods, Minaki.
- *Clintonianus* Pk. In low woods, Birds Hill.
- *edulis* (Bull.) Fr. In sandy coniferous woods, Victoria Beach.
- flavus* Wither. Recorded from Kenora and Winnipeg.
- *granulatus* (L.) Fr. Common among conifers, Victoria Beach, Ingolf.
- luteus* (L.) Fr. Woods, Ingolf, W. N. Denike.
- rubellus* Pk. Pilei 3-6 cm. wide, yellowish to reddish-brown, stem yellowish at base and within, pores yellow with orange mouths, spores 8-10 × 3-4 μ , cystidia abundant especially near mouths, 40-50 × 8-10 μ , brownish. Leaf-mould in poplar woods; M.A.C.
- *scaber* (Bull.) Fr. Common in midsummer in woods; everywhere.
- *sphaerosporus* Pk. Deciduous woods; M.A.C. First found in 1926, fairly common in 1927.
- *subaureus* Pk. Victoria Beach, Kenora.

- Helotia* (n) *subuliginosa* Fr. Among pines, Victoria Beach, Ingot.
 — *versipellis* Fr. Possibly only a form of *H. ascheri*. Common.

Agaricaceae

(1) *Leucosporae*

- Amantia imperiger* Ath. On sand under *Pinus Banksiana*, Victoria Beach, Sept. Not common.
porphyria Fr. In low woods, Kenora and Ingot, Aug-Sept.
 — *muscaria* Fr. Widely distributed in Manitoba. At M & C it usually first appears in early August and it may continue through September, often common in open woods in August. Our plants are orange yellow, not scarlet as in European collections (see p. 48).
 — *phalloides* Fr. Commonly found, Victoria Beach, Mank. Sept.
ramuloides Fr. Yellowish pale with long stipes, in open woods, M.A.C., August.
 — *collaris* Fr. Kenora, Sept.
varia Fr. Mank. Pines with stipes along the stem margin, Sept.
 (n) *strosa* Fr. Mank. Sept.
Amantopora fulva (Schaeff.) W. & G. Fairly common.
 — *virginata* Fr. var. *alba* Sacc. Common at M & C and elsewhere during the summer.
virginata Fr. var. *livida* Fr. Coniferous areas.
strigulata Fr. Kenora, M.A. July-Oct.
Apollonia caligata Fr. Occasional in coniferous areas, Aug-Sept.
 (n) *leucis* Fr. Victoria Beach, Sept.
melles Fr. Abundant in all its disguises, and often in poison to living trees. Exposed mycelium phosphorescent until it becomes protected by a thin blackening layer, which appears as a black dot in a split stump. The cause of this has been known to woodmen and others.
Cantharellus autumnalis Fr. Coniferous woods, Norway House southward, Aug.-Oct.
alibates Fr. Coniferous woods, very abundant at Victoria Beach in 1928, Aug.-Sept.
 — (n) *cinabarinus* Schaeff. Victoria Beach, Aug.
 — *infundibuliformis* Fr. In a swamp, Kenora.
lobosporus Fr. In fringing woods, Victoria Beach, M & C, Sept.-Oct.

Cantharellus umbonatus Fr. Common in coniferous woods as far north as Norway House. Often found on mossy rocks, July-Oct.

Clitocybe striatodactylea Pk M A C woods, Aug. Sept.

— *albida* Pk M A C, Aug. Sept.

— *alberina* Pk M A C, July Spores echinulate in this species.

biserius Pk M A C; July

(n) *candicans* Fr. M A C August

— *caroliniana* (Bk.) Bres. Victoria Beach, Sept.

calina Fr. Victoria Beach, Sept.

(n) *dealbata* Fr. Ingolf, Aug.

decora Fr. Gimn., Sept., T. Johnson.

— *ecypoides* Pk Victoria Beach, July-Aug.

farinacea Murr. A *Clitocybe* which fits this description occurs in autumn on old sawhast in an ice-house at M.A.C.

— (n) *fragrans* Fr. Rickers M.A.C., August.

gigantea Fr. Minaki and Kenora, Sept-Oct.

infundibuliformis Fr. M A C, July-Aug.

maxima Fr. Victoria Beach, Gimn., Sept. Oct.

— *morbilis* Pk On livers, ocean road, Winnipeg, M.A.C.

— *multiceps* Pk. Common for several years on sawn, M A C, Ingolf. Capstems and piles often deformed by crowding.

odora Fr. Common, M A C, Victoria Beach. Whitish to greenish.

— *odora* var. *anisaria* Pk. M.A.C.

proserp Kauff. Among grass in sandy soil, Victoria Beach, June.

— *pulcherrima* Pk. On old wood, Victoria Beach, Aug.

— *truncicola* (Pk) Sacc. On old deciduous logs, M.A.C., Kildonan Park, Aug-Sept.

Collybia (n) *acervata* Fr. On ground in woods, Victoria Beach, M.A.C.

— (n) *agrostis* Fr. M.A.C.; June.

— *stratoides* Pk On old wood, M.A.C., July.

— *styracis* Fr. Common, M A C, Kenora, Aug. Oct.

cirrhata Fr. What may be this species (no sclerotia were present at the time) was collected at Victoria Beach; August.

— *cirrhata* var. *Doekel* Bres. This small fungus, which develops its irregular, rounded, yellow sclerotia on decaying agarics, is not uncommon, Gimn. Kenora, Minaki.

— *tolosa* Pk. Victoria Beach, M A C, June-July.

— *confinis* Fr. Victoria Beach, Ingolf, July-Aug.

<i>Agrostophora desertorum</i> (L.)	Nov. 1900	Mar. 1901	Sept. 1901	Oct.
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1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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	Age	Sex	Height (cm)	Weight (kg)	Body mass index (kg/m ²)	Waist circumference (cm)	Waist-hip ratio	Triceps skinfold thickness (mm)	Subcutaneous fat thickness (mm)	Visceral fat thickness (mm)	Visceral fat area (cm ²)	Visceral fat volume (cm ³)
1	25	M	175	75	24.5	95	0.95	12	10	15	15	15
2	28	F	165	65	23.8	85	0.92	10	8	12	12	12
3	30	M	180	85	27.2	105	0.98	15	12	20	20	20
4	32	F	170	70	24.1	90	0.94	11	9	14	14	14
5	35	M	178	80	25.0	98	0.96	13	11	16	16	16
6	38	F	168	68	24.4	88	0.93	10	9	13	13	13
7	40	M	185	90	26.5	110	0.99	16	13	22	22	22
8	42	F	172	72	24.4	92	0.95	11	10	15	15	15
9	45	M	182	88	26.9	108	0.97	14	12	18	18	18
10	48	F	175	75	24.5	95	0.94	12	11	16	16	16

1. *Journal of the American Medical Association*, 2000; 284: 101-106.

1. **Learning Objectives**

17. *See* e.g., *United States v. Jones*, 101 F.3d 1033, 1037 (9th Cir. 1997).

[illegible][illegible]

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	

Year	Population	Area	Population	Area	Population	Area	Population	Area
1990	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2000	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2010	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2020	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2030	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2040	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2050	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2060	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2070	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2080	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2090	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100
2100	1,000,000	100	1,000,000	100	1,000,000	100	1,000,000	100

Figure 1b. Vertical Heart Sept. The yellow granules at the apex of the sternum are those of *M. elongatus*.

Product: **Product Name** **Product Code** **Product Description**

[illegible]

Section—Dept.

Region	Number of cases	Number of deaths	Number of recoveries
North America	1,234	45	1,189
Europe	2,345	89	2,256
Asia	3,456	123	3,333
Africa	4,567	156	4,411
Oceania	5,678	189	5,489

[illegible][illegible]

First, whereas increasing rainfall probably also increases the number of species, the species are 10×10 .

— **WILLIAM D. HARRIS**, *Director, Center for the Study of the History of the United States, University of California, San Diego*

[illegible]

- Lecanora laevigata** (Swamp) H. & Pe. Common throughout the season, especially in coniferous areas as far north as Norway House. As in Europe, very variable in external appearance. I might be called the "charcoal-like fungus".
- laevigata var. striatula** Ph. M. A. C. July.
- subpurpurea** Berk. Common. M. A. C. Ingolf, Kenora.
- terrestris** (L. Fr.) Berk. I compared plants possibly of this species were obtained at Kenora. Sept.
- Lectura affinis** Ph. Often a constant and well developed at Victoria Beach. Also at Kenora.
- silvatica** Fr. On sand among pines. Victoria Beach, Sept.
- subrosea** Fr. M. A. C. Ingolf. Aug.
- fuliginea** Fr. Common in coniferous areas. One of the most common collected by my group.
- In **fuliginea** Fr. Kenora. Sept.
 - **gibbosa** Fr. Reported near Minto.
- lutea** Fr. Ingolf, Kenora. Aug. Sept.
- lutea** Schw. This striking fungus has been collected but once, so rarely, as at Victoria Beach. Sept. 1898.
- lucida** Fr. In coniferous woods. M. A. C. St. Norbert, Victoria Beach, July.
- lutea** Ph. Norway House. August.
- purpurea** Fr. Fairly common. M. A. C. Kenora, Carleton Place. Often parasitized by *Hymenochaete* but *fluorescens* which prevents the development of the gills and turns the pores orange red, in which condition it is often gathered and dried for winter use by foresters. It is sometimes sold on the St. W. Winnipeg market under the mistaken name of "charcoal".
- In **purpurea** Fr. Ingolf. August.
- pruinosa** Fr. Victoria Beach. Minto. Sept.
- rubra** Fr. Common in coniferous areas. Aug. Sept.
- subulnaria** Fr. Victoria Beach. Kenora. Sept.
- subpurpurea** Ph. On mainly on. Victoria Beach. Aug. Sept.
- terminans** Fr. Common. M. A. C. to Kenora and Norway House.
- trivialis** Fr. Victoria Beach, Ingolf.
- lutea** Fr. Kenora. Sept.
- trivialis** Fr. Kenora, Ingolf. Carleton Place. Collected by squirrels at Trinitas.
- vulgaris** Fr. Often very large. Kenora, Victoria Beach.
- (N) **vulgaris** Fr. Minto. Sept.
- vulgaris** Fr. Ingolf. Aug.

- Lentium cochlearis* Fr. Old larch, Victoria Beach, H. J. Brodie, Aug.
lucidus Fr. Everywhere on railway ties, etc.
 — *subulatus* Berk. On fallen poplar, M.A.C., St. Norbert, June.
 — *vulpinus* Fr. Poplar stumps, M.A.C., Victoria Beach, Aug.
Lepiota acutesquamosa Fr. Ingolf, Aug.
 (n) *crispatis* Fr. M.A.C., Sept.
 — *clypeolaria* Fr. M.A.C. Victoria Beach, July-Oct.
cristata Fr. M.A.C., Victoria Beach, July-Sept.
 n *geniculospora* Atk. Brown poles, bearing long spores. Ingolf, M.A.C., Aug.
 — *gloderma* Fr. Victoria Beach, Aug.
granulosa Fr. Sometimes on mossy rocks, Victoria Beach, Kenora, Sept.-Oct. Transferred to *Armillaria* by Kauffmann.
 — *naucina* Fr. M.A.C., Winnipeg, July-Sept. Sometimes found on grassy boulevards.
Marasmius andromaceus Fr. On pine needles, Victoria Beach and Lake of the Woods, July-Aug.
 — *cohaerens* (Fr.) Bess. Fairly common, M.A.C., etc., July-Sept.
epiphyllus Fr. Fairly common, M.A.C., Victoria Beach.
lenticus Fr. On old cedar twigs, Victoria Beach, Sept.
 (n) *glabellus* Pk. Victoria Beach, Aug.
minutus Pk. On old leaves, M.A.C., Aug.
oreades Fr. On larch. M.A.C. Not common.
 — *polypyrus* Pk. M.A.C. Larch. June-Aug.
rotula Fr. Common on old leaves and twigs, M.A.C.
micros Scler. Recollected from Winnipeg.
 (n) *spongiosus* B. & C. On sand, Victoria Beach; July.
versus Fr. Victoria Beach. Kenora, M.A.C., July-Oct.
velutipes B. & C. On old leaves, M.A.C., Aug.
Myrcena acicula Fr. This beautiful little *Myrcena* is fairly common on leaves and fallen twigs at M.A.C., Victoria Beach, etc. The spores were found to be $8-11 \times 3-4 \mu$.
albina Fr. M.A.C. Kenora, etc., June-Oct.
ammoniaci Fr. M.A.C., Kenora, Sept.-Oct.
 (n) *atroalboides* Pk. On old wood, Victoria Beach.
clavicularis Fr. var. *fulvipes* Kauff. Kenora, Sept.
cyathophila Atk. Victoria Beach.
 — *dischelis* Fr. On old wood, M.A.C., Oct.

- Myosia exilis* Fr. Kenora, Victoria Beach, Aug-Sept.
 — *galericulata* Fr. M.A.C. Victoria Beach, July-Oct.
 — *haematodes* Fr. M.A.C., Victoria Beach, Indian Bay, June-July.
 inclinata Fr. or var. M.A.C., Victoria Beach, July-Oct.
 leptoccephala Fr. M.A.C. June-Oct.
 minutula Fr. M.A.C. Kenora, June-Aug.
 parabolica Fr. On old wood, Victoria Beach, Sept.
 polianthina Fr. M.A.C., July-Sept.
 polygramma Fr. var. *albida* Kauff. M.A.C., June.
 • *pura* Fr. Common. M.A.C. Victoria Beach, Kenora. The colour varies from white to shades of reddish blue.
 purpureofusca Fr. Victoria Beach, July.
Omphalia campanella Fr. Very common in coniferous areas from May to Oct. Usually in troops on fallen, well-decayed coniferous trunks in woods.
 • *epithymum* Fr. M.A.C., Victoria Beach, Kenora, June-Sept.
 filia Fr. Kenora, Oct.
 • (n) *exilis* Fr. M.A.C., Aug-Sept.
 (n) *rugosolacca* Fr. On old wood, Victoria Beach, Sept.
 (n) *scryphiformis* Fr. Victoria Beach, Sept.
 umbellata Fr. On old log, M. naki, Sept.
Peziza angustata Berk. On old wood, Victoria Beach, June-Aug.
 — *radia* Fr. Common on old *Fraxinus* wood, M.A.C., Kenora, Victoria Beach, June-Oct.
 styliana Fr. var. *hirsutissima* Haller. Occasional on old wood of poplar, birch, oak, M.A.C., Kenora. Pile luminous when moist, and mycelium in culture also luminous.
Pleurotus applanatus Fr. On old wood, M.A.C. Probably widespread.
 • *atroconcoloratus* Fr. var. *minimus* Dearness and Bushy, n. var. Pile only 5-10 mm. broad, spores $7-10 \times 4-5 \mu$, white at first, cystidia 35-60 \times 10-15 μ , roughened above, brownish below, otherwise resembling var. *gracilis* Fr. On old wood, Victoria Beach, June 2 and June 12, 1933.
 atropileatus Fr. On old wood, Victoria Beach, Aug.
 • *circinatus* Fr. Reported at Winnipeg.
 elongatipes Fr. On old *Acer* logs, M.A.C., August.
 fulvipes Fr. or a variety. Old logs, Victoria Beach, Sept.
 — *obtusatus* Fr. Common and widespread on old wood.

- Fluorina pubescens** Fr. On old wood Victoria Beach, Misaki, Aug.-Sept.
- gambosii** Kuhn. On old logs Wausung
- gibbosa** Fr. On old wood, M A C, July
- gibbosa** Ph. is a variety. Old wood, M A C, Kidoan Park, Aug.-Sept.
- gibbosa** Fr. A specimen of this noteworthy species, with glaucous, coarsely reticulated surface on the palm, and with glaucous reticulate spores 4-5 μ , was found at M A C July 31 1948. Seen also previously at Wausung. Illustrated by Cooke as *Pluteus phlebotomus*.
- glauca** Fr. Very common on living and dead Arceuthobium etc. in wet woods. The poles are frequently seen protruding from trunks made by eating off large branches. It is a wood parasite, but apparently does not cause the death of the tree.
- Gymnopus affinis** Ph. M A C July-Aug.
- affinis** Ph. Top of Victoria Beach, Aug.-Sept.
- hirsutus** Fr. Victoria Beach Sept.
- hypocistis** Kaulf. M A C Aug.
- hypocistis** Kaulf. M A C Ingrid. Collected by squarids at Misaki.
- hirsutus** Kaulf. Misaki Victoria Beach, M A C, Aug-Oct.
- chrysosporium** Fr. Norway House, M A C Aug.
- hypocistis** Fr. Common on sandy soil among *Pinus Banksiana* Victoria Beach etc. Aug-Sept.
- fulvus** Fr. M A C Victoria Beach Kurena July-Sept.
- fulvus** Sacc. Plants agreeing with this species, with flesh turning reddish then black were found in sandy pine woods at Victoria Beach July-Aug.
- fulvus** Fr. No specimens July-Sept.
- fulvus** Fr. Norway House Victoria Beach M A C.
- fulvus** Fr. Common among pines Victoria Beach.
- (n) **fulvus** Ph. M A C July.
- fulvus** Fr. Victoria Beach July-Aug.
- fulvus** Fr. Victoria Beach Kurena Aug-Sept.
- griseosporus** Quel. (R. arragonensis Victoria Beach, Norway House Ingrid M A C Aug-Sept.
- fulvus** Fr. Catch Victoria Beach Ingrid Aug-Sept.
- fulvus** Fr. Ingrid M A C July-Aug.
- fulvus** Fr. Victoria Beach Misaki Sept-Oct.
- (n) **chrysosporium** Kaulf. Ingrid, July.
- (n) **fulvus** Sacc. Bore M A C, July.
- fulvus** Fr. M A C, July-Aug.

- Basidiocystis** *serotilis* Fr Victoria Beach Ingrid, Aug-Sept
laevigata Karst Victoria Beach July
 (= *retrovata* Fr Ingrid Aug
 = *viridula* Fr Victoria Beach, Kenora Sept
strampeliana Fr Victoria Beach Ingrid M A C, July, Sept
Schizophyllum *commune* Fr Everywhere on dead wood, especially on stumps and trunks. The pins withstand natural desiccation, and retain their viability through the winter
Tricholoma *arvatum* (Schaeff) Fr Victoria Beach, Ingrid, July, Sept
luridum Hb! Fr similar to *T. melaleucum*, but stem brown rather than Ingrid M A C, July-Sept
 on *dissectatum* Fr Ingrid M A C Aug-Sept
equale Fr Victoria Beach Kenora Sept-Oct
 (= *humicola* Berk Fr Victoria Beach Sept
melaleucum Fr Common on lawn, M A C, Sept-Oct, rarely in June
radium Fr Victoria Beach, M A C, Minaki, Aug-Sept
ulmarum Fr Minaki, Oct
 on *pubulum* Fr M A C, Aug-Sept
pusillum var *campanulum* Berk Victoria Beach
portentosum Fr Common and widespread on stumps in woods. Like scattered or an irregular, or occasionally an interrupted fairy ring
 (= *portentosum* Fr Kenora Sept
rotulae Fr Victoria Beach Kenora, Sept
 (= *subacutum* Fr Minaki Victoria Beach, Sept-Oct
 (= *subtilem* Fr Large velvety plants with globose spores and solid stems Victoria Beach Sept
terreum Fr Ingrid common M A C July-Oct
transversum Fr Victoria Beach Minaki M A C Sept-Oct
tumidum Fr Victoria Beach Sept
Tremula *crispa* Fr Common on old wood, especially bark, Norway House southward

(2) Rhizosporium

- Cladopus** (= *lychnopus* Fr On rotten wood, M A C, Aug. Spores $2-4 \times 4 \mu$.
applanatus Murr This striking species, well named because of its penetrating asphodelous colour when fresh, is common on old decaying wood or stumps, or around the base of living trees, along the Red River, M A C to

St. Norbert, in July and more rarely in August or even to the middle of September. From repeated examination of fresh specimens we are able to supplement the original description in *Mycologia* 17: 298, 1913. Pileus usually sessile, sometimes central, convex, plane, or concave, gregarious or scattered, 2-6 cm. broad, surface dry, usually silky, slightly concentrically zoned, white to grayish, sometimes with a tinge of green when young, fragile, margin persistently incurved, context thin, watery white, rather when fresh or white drying, resembling that of a skunk, but with a suggestion also of garlic. Gills minute to minute broad, tending to break as the pileus expands, thick on edge and slightly serrate, white becoming rose coloured. Stem 1-2 cm. by 2-7 mm., usually silky, solid, white. Spores angular, deep rose, to black reddish in mass, $8-11 \times 6-7 \mu$.

***Canthopus rubellus* Fr.** Common throughout Manitoba on old wood in autumn, and sometimes overwintering to shed spores the following spring.

***Clitophus novaeboracensis* Pk.** (probably *C. populeus* Fr.) On leaf mould, sometimes on old wood, Victoria Beach, Manx. July-Sept.

(n) *subplanus* Pk. M.A.C., July.

(n) *subtilis* Pk. Kenora, Sept.

***Ecclia (n) griseo-rubella* Fr.** In soil, St. Jean, Sept.

(n) *glauca* Pk. Rarely soil, Victoria Beach, July.

(n) *roseoalbostriata* Atk. M.A.C., Aug.

***Ectoloma albidum* Hurr.** Laccate, only grayish brown, pileus and subfarinaceous colour and taste, spores $8-10 \times 6-8 \mu$. Kenora, Oct. 1.

(n) *clypeatum* Fr. Kenora, Sept.

(n) *griseum* Pk. Ingolf, Aug.

***griseum* Pk.** Kenora, M.A.C. On ground in orchard, July-Oct.

***hirsutum* Hurr.** or a variety. Victoria Beach, June-Sept.

(n) *rhodopileum* Fr. Kenora, Sept.

***sericeum* Hurr.** M.A.C., Aug.

***serotum* Fr.** M.A.C. Victoria Beach, July-Sept.

***strictum* Pk.** Swampy woods, Victoria Beach, Aug.

***Leptogium asperum* Fr.** Kenora, M.A.C., July-Oct.

— (n) *botryosum* Fr. In low woods, Kenora, Sept.

— *griseum* Pk. Common, M.A.C., July.

***solisum* Atk.** On old wood, Victoria Beach, June.

***Teloloma (n) dyssiduum* (Pk.) Atk.** M.A.C., July.

- Helveta (n) fuscescens* Ph. Common, Victoria Beach, July
 - common Fr. M.A.C., July
- Polyporus admirabilis* Ph. On old wood, Victoria Beach,
 Guelph, Kenora. June-Sept.
- *sericans* Fr. Common on old wood and woodcut, Victoria
 Beach. M.A.C. Kenora, Aug-Oct.
 - (n) *epheorus* Fr. M.A.C. July
 - *granularis* Ph. On old wood, Victoria Beach, July-Aug.
 - granularis* var. *undecimlatus* Ath. Victoria Beach, June.
 - lenticularis* Fr. On old wood. M.A.C., Victoria Beach,
 June-July.
 - longistriatus* Ph. Old wood, Victoria Beach, June.
 - minis* Fr. On old wood, M.A.C., June-Sept. A few
 piles appear throughout the summer.
 - musci* var. *intensius* Fr. M.A.C., July.
 - *pubescens* Fr. of variety. With base of stem blue-green,
 stem and piles showing more green as they dry. Old
 wood, M.A.C., July-Aug.
 - *sterilemarginalis* Ph. Old wood, Victoria Beach, July.
 - *tomanticulus* Ph. Old damp wood, M.A.C., Victoria
 Beach, June-Aug.
 - undecimlatus* Fr. On woodcut piles, Manak, Kenora,
 Sept-Oct.
- Teluraria glaucophala* Fr. Marg. strata, no cystidia, spores
 13-18 x 7-8 μ . In alfalfa field, M.A.C., June.
- phoenicentipes* Ph. Ingolf, Aug.
- *pusilla* Fr. Fairly common on ground in damp woods,
 M.A.C. Victoria Beach. Pileus minutely silky with a
 smooth almost vertical fold, but not really raised, minutely
 striate, but becoming rumose. The pileus is white except
 for a slight amber tinge on the small umbos. July-Sept.
 - speciosus* Fr. Rich soil, M.A.C., Guelph, Mallock. July-
 Oct.
 - striatula* Ph. On lawn. M.A.C. July-Sept.

(3) *Ochrosporeae*

- Belizium fragile* Fr. This form with glabrous yellow stem is
 rare, woods, M.A.C. June.
- *linear* Berk. Rare on lawn. M.A.C., July.
 - *villosius* Fr. On dung, M.A.C., Kenora, etc.; June-
 Sept.
- Coriarius acutus* Fr. Victoria Beach, Sept.
- *adversicolans* Fr. Not uncommon, M.A.C., Ingolf, Kenora.
 - *annulatus* Ph. M.A.C., July-Sept.
 - *angustatus* Fr. Victoria Beach, Kenora, Sept.-Oct.

- Ortilasteria argentea* Fr. or var. Victoria Beach, Sept.
 — *arabellae* Fr. Common, Victoria Beach, Keweenaw, etc., Sept.
- Athrometazone* Kauff. A striking species, Victoria Beach.
 (n) *brunneoflavus* Fr. M A C. Minaki, Sept.
calochroa Fr. Norway House; Aug.
cinnabarinus Fr. Victoria Beach. Keweenaw. Aug.
cinnamomeus Fr. Keweenaw Inland. Aug. Oct.
 (n) *clavicolor* Fr. M A C. July Sept.
coloratus Pk. M A C. Victoria Beach. Aug. Oct.
 (n) *communis* Pk. Victoria Beach. Sept.
 (n) *croceicolor* Kauff. M A C. Aug.
 (n) *cylindripes* Kauff. Victoria Beach, Keweenaw, Aug. Oct.
discoloratus Fr. M A C. Keweenaw, Sept.
distans Pk. M A C. July Sept.
dispariflor Fr. or var. Minaki. Sept.
erectus Fr. Victoria Beach, M A C., Sept.
 (n) *fascesolaceus* Pk. Spores 8-10 x 4-6. Minaki.
hemisphericus Fr. Minaki. Sept.
hypetionus Fr. Victoria Beach. July.
- *impolitus* Kauff. Victoria Beach, Sept.
 (n) *infractus* (Pers.) Bres. Victoria Beach, Sept.
ilicinus Pk. M A C. Aug. Sept.
ignarius Pk. On old wood. Victoria Beach, Sept.
incisus Fr. Common in autumn, occasionally in spring (June, early July). M A C., Victoria Beach, Keweenaw.
- olivaceus* Pk. Minaki, Victoria Beach. Sept.
pallescens Fr. Victoria Beach. Keweenaw. Sept.
pholidus Fr. Victoria Beach. Keweenaw, M A C.
planigis Fr. Victoria Beach. Sept.
 (n) *purpureophyllus* Kauff. Victoria Beach, Sept.
- *raphanoides* Fr. Victoria Beach. Sept.
ruficoccus Fr. variety. Minaki. Sept.
 (n) *rufocinnareus* Pk. Victoria Beach, Sept.
- *rugulatus* Fr. Victoria Beach. Sept.
- *sensuarius* Fr. Common. Inland. Victoria Beach.
sphaerosporus Pk. Victoria Beach, Sept.
 (n) *squamulosus* Pk. Victoria Beach, Aug.
- subpachytholus* Kauff. M A C. Aug. Sept.
torosus Fr. Keweenaw, M A C. Sept. Oct.
- *villosus* Kauff. Victoria Beach, Sept.
- *virescens* Fr. Victoria Beach, Keweenaw, Inland, Aug. Sept. Only a few specimens of this striking fungus were found each year.

- Crematogaster applanatus** Fr. Inaequal Aug.
subulipes Fr. On old poplar wood etc. M.A.C., and on
 chips, Minaki, June-Sept.
- clavarioides** Fr. M.A.C. Manitoba. July-Sept. This
 fungus is the fungus so largely common in this area,
 having been found about a dozen times on old poplar logs.
 Kny's people have been endeavoring to demonstrate the
 honey-spores. This species, reported by Kauffman as
 having been found only twice in Michigan, has since been
 recorded 7 on Hudson and been reported also from
 Ohio and Alabama.
- destruens** Fr. Victoria Beach, M.A.C. July.
- fulvotomentosus** Fr. Victoria Beach, M.A.C. July-Aug.
- hirsutus** Fr. This sort of species is occasionally found on old
 poplar, M.A.C., June-Oct.
- hirsutus** Fr. Norway House, Arctic River, Victoria
 Beach, M.A.C.
- melancholicus** Fr. A.C. Victoria Beach. July-Aug.
- ovatus** Fr. M.A.C. June-Sept.
- silvaceus** Pers. Quel. Although we have not seen this
 recorded from North America, our specimens were not
 found to at any other description. The gills are orange
 brown when fresh, but the spores are rusty. On old pine
 boards, M.A.C., August.
- strobilatus** Fr. A.C. Victoria Beach. Aug.
- subulipes** Fr. Fairly common on old poplar sometimes also
 apparently on cedarwood wood. When on the top of a
 fallen log the stem may be central. M.A.C., Victoria
 Beach, July-Aug.
- versatilis** Fr. Fairly common, M.A.C. June.
- Flammula** **terrestris** Schaef. Fr. Minaki, Sept.
- fulva** Fr. Top of Victoria Beach. Aug-Sept.
- polychroma** Berk. Bush Hill. Sept.
- repens** Fr. Common on cedarwood wood, Kamora,
 Norway House Victoria Beach, M.A.C.
- spumosa** Fr. M.A.C. Kamora. Sept-Oct.
- Galeria** **bulbosa** Karst. On large Victoria Beach and
 are common in old home-dung cultures in the laboratory.
 Known by its bulbous base.
- mytiligena** Fr. Chocomaui, M.A.C., Aug-Oct.
- hypocraea** Fr. On mosses, Victoria Beach, Kamora,
 Aug.-Oct.
- lucida** Fr. On wood-land on an old house. M.A.C. Sept.-
 Oct.
- (n) **polyporus** (n) Minaki. Sept.

- Galera tenera* Fr. G.Mk. Victoria Beach, M.A.C., June-Sept
 — *teneroides* Pk M.A.C.; June-Aug.
Nebelina albidulum Pk M.A.C.; Aug.-Oct.
 (n) *album* Pk Kenora, Sept.
 — *Colvini* Pk Not uncommon on sandy beach, Victoria Beach, Sept.
crustuliniforme Fr. M.A.C., Sept.
 (n) *longicaudum* Fr. On Sphagnum, Norway House
sinapisans Fr. Victoria Beach, Sept.
 — (n) *velatum* Pk M.A.C., Sept.
Inocybe asterospora Quai. Victoria Beach, Aug.
 (n) *caccarita* Fr. M.A.C., July-Sept.
caccarita E. & E. Victoria Beach on sand, Aug.
 — *Cochlea* Berk. M.A.C., Aug-Sept.
 — *corydalina* Quai. M.A.C., Aug. Stem with bulbous, decipienteoides Pk Victoria Beach, Aug.
 (n) *enteloides* Pk M.A.C., Aug.-Oct.
fastigiata Bres. Common, Manitou, Trestank, Gilbert Plains, M.A.C., Victoria Beach.
 (n) *fastigiella* Atk. M.A.C., Sept.
 — *Stroos* Bres. (but gills scarcely free). M.A.C., July.
Succinea Berk. Ingolf, St. Norbert, Victoria Beach, July-Sept.
frumentacea Bres. M.A.C., July-Sept.
geophylla Fr. Fairly common, M.A.C., Victoria Beach, July-Sept.
 (n) *Godeyi* G.H. Victoria Beach, Aug.
infelix Pk Kenora, Sept.
leptophylla Atk. This fine species is fairly common at Victoria Beach, June-Sept.
Slacina Fr. Not uncommon, M.A.C., Aug. Oct.
minima Pk Norway House Victoria Beach, M.A.C.
pallidipes E. & E. M.A.C., Victoria Beach, June-Sept.
 — *pyriodora* (Pers.) Bres. M.A.C., July.
 — (n) *radiata* Pk Victoria Beach, Aug.
rimosoides Pk M.A.C., Sept. Oct.
rufidula Kauff. M.A.C., Victoria Beach, Ingolf, Aug.-Oct.
sindonia Fr. Woods, M.A.C., Aug.
substrata Kauff. Victoria Beach, M.A.C., Kenora, July-Sept.
 — (n) *violaceifolia* Pk. Pileus 10-15 mm. subconic, brownish, silky, stripe violet, young gills violet, spores 8-10 x 4-6 μ , cystidia on sides and edges of gills, about 45 x 14 μ . Indian Bay, M.A.C., Aug-Sept.

- Bostrychia** Fr. *virgata* Ask. Moist woods. M.A.C. July.
Cantharellus Fr. *indulgent* Fr. Old coniferous wood, Victoria Beach, Sept.
conopsea Fr. Old wood. M.A.C. June-Aug.
 " *hirsuticulus* Fr. Victoria Beach, Aug.
Epizoa Fr. M.A.C. Victoria Beach. Birds Hill, Kinsmen, Aug.-Oct.
pubescent Fr. Norway House. M.A.C. July-Aug.
puberulus Fr. The lakes. M.A.C. Brandon. July-Aug.
Epurea Fr. Victoria Beach. July.
versalis Fr. M.A.C. May-June.
Penicillium *menthae* Fr. Marsh. M.A.C. July-Sept. Often abundant at M.A.C.
parvum Fr. N.4. common on marshland. Common.
Phallia *edipura* Fr. On natural. Victoria Beach. M.A.C.
apocrypha Fr. Victoria Beach. July-Sept.
gurgulio Fr. From wood of trapped sticks, M.A.C. Sept.-Oct.
 " *bellaria* Fr. M.A.C. Victoria Beach. June-Aug.
dispora Fr. Ingot. Kinsmen. Aug.-Oct.
conjugata Fr. On wood. Victoria Beach. June-July.
Distragus *flavus* Fr. Old wood. Common. Aug.
 " *discolor* Fr. Old wood. Victoria Beach. Sept.
viridis Fr. Old wood. Victoria Beach. Sept.
crassus Fr. On logs. M.A.C. June-Aug.
fulvo-aurantius Fr. Large standing plants. Exceedingly common on natural coniferous wood at M.A.C., also at Victoria Beach. The orange spores suggest *Psalliota*, June, but mostly Sept.-Oct.
marginata Fr. On old wood. M.A.C. Sept.
de murina Fr. On old logs. M.A.C. July.
melaleuca *Schaeff.* Fr. On old wood. Victoria Beach. June.
griseus Fr. On the ground. M.A.C. June.
fulvus Fr. In an old house. M.A.C. Sept.
spicillatus Fr. Has occurred for three years on one large fallen log at M.A.C. also at Victoria Beach. June-Oct.
quercus Fr. With spores larger than the rest, Victoria Beach, Kinsmen, Sept.
quercusoides Fr. More common than the preceding. M.A.C. and Victoria Beach, Kinsmen. July-Oct.
lat. regularis Hall. Quail. Victoria Beach, M.A.C., June-Oct.
 " *spumig* *Vahl.* Fr. On old wood and abundant. M.A.C. Birds Hill; Sept.-Oct.

Pholiota verrucifera Pk. Reported.

Pluteolus coprophilus Pk. On manure piles and on dung cultures in the laboratory, Winnipeg.

expansus Pk. On debris and rich soil, M.A.C., Matlock, July.

reticulatus Fr. On old wood, M.A.C., Victoria Beach, July-Sept.

Tuberia furfuracea Göl. Common on stumps, etc., M.A.C., Guelph, Aug.-Oct.

inguinalis (Fr.) Göl. On sawdust in an ice-house, M.A.C., Sept.-Oct.

(4) *Porphyrosporae*

Hypholoma appendiculatum Fr. M.A.C., Victoria Beach, July-Oct.

— *coronatum* Fr. M.A.C., July.

— *hircoloratus* Fr. Guelph, Victoria Beach, Kemora, June-Sept.

hydrophorum Fr. Both the forms described by Kauffman have been found. M.A.C., Minaki, July-Sept.

— (n) *hymenocepalum* Pk. M.A.C., July.

interium Fr. On lawns, etc., M.A.C., Victoria Beach, St. Norbert, June-Oct.

— *interium* var. *cyathoides* Kauff. In woods, M.A.C., June-July.

lachrymansdum (Fr.) Quel. Specimens are occasionally found that appear to be this species.

— *rugocepalum* Ask. M.A.C., July.

— *saccharinophyllum* Pk. M.A.C., Birds Hill, June-Sept.

— *sublateritium* Fr. M.A.C., Victoria Beach, June-July.

velutinum Fr. Quel. M.A.C., Victoria Beach, June-Oct. A form, evidently of this species but with spores nearly smooth, is common on lawns at M.A.C.

— *vinosum* Kauff. Found once, M.A.C., Aug.

Hypholoma longipes Dearness and Baly n. sp. Pileus 6-14 cm., separate or capitate, gibbous then hemispheric, finally planoconvex, sometimes upturned on the margin and broadly umbonate, minutely floccose-striate especially towards the margin, viscid, whitish with lavender tinge, then buff drying buff to blackish brown. Flesh whitish, then buff drying buff to blackish brown. Gills broad, chocolate-brown, adnate or arcuate and adnate-decurrent by ridges on the stem, whitish at first, soon purplish and mottled, edge white-fimbriate not distilling droplets; clusters of 8-20 sterile cells, subventricose, often capitate,

44-75 x 10-15 μ , on edge of gills. Cystidia not observed on sides of gills. Stems 6-18 x 1-2 cm, shining, concolorous or paler than the caps, sometimes brownish purple at the base even minutely lichenous, striate below easily splitting and whitish at first, evanescent, sometimes minutely fringed toward base of stem. Spores purple brown, sub-elliptic, smooth under oil immersion lens, 8-12 x 5-7 μ .

Growing throughout the season on or near the floor of an old dug-out, whose walls and roof had been supported by poplar poles. M.A.C. First collected Oct. 27, 1927, several times from June 15 to late in Oct. 1928. J.H. (D. S.C.). This fine species suggests *Pezizopsis lutea* Kaulf. but *P. lutea* is hygrophanous and has cystidia on the sides of the gills.

***Pezizopsis streptotheca* Fr.** In woods, M.A.C., Victoria Beach, Kenora; Aug.-Sept.

arvensis Fr. Victoria Beach, Winnipeg, July-Aug.

compuncta Fr. Lawna, etc., M.A.C., and elsewhere. Usually in autumn.

n. concolora Fr. Woods, M.A.C. Aug.

— *diminutiva* Fr. Victoria Beach, July.

heterothecaria Fr. Victoria Beach, Sept.

— *in. placentosa* Fr. Winnipeg, Aug.

Robinsoni Fr. M.A.C. campus, June.

subulnosa Fr. M.A.C. Sept.

***Pezizopsis persimilis* Hertz.** Money wood, M.A.C., Sept.

— *in. tenuicollis* Berk. & H. On dung, M.A.C., July.

umbonata Fr. On decayed wood, M.A.C., June-Sept.

***Pezizopsis n. agrariae* Atk.** Winnipeg, June.

albicans Fr. Among sphagnum, Kenora, Sept. Spores 12-15 x 4-6 μ .

leuconella Fr. Common among grass, M.A.C. Victoria Beach, June-Sept.

— *in. mordax* Fr. On horse dung, M.A.C., July. Spores 10-13 x 7-8 μ .

in. murcia Fr. Damp rich soil in woods, M.A.C., Kenora, Birds Hill. July-Oct.

phylogena Fr. Small specimens, agreeing fairly well with description except in their being found among moss on sand: Victoria Beach.

subulnosa Fr. On moss and debris, M.A.C. June-Aug.

— *ula* (Fr.) Bat. M.A.C., Aug.

***Sporopharia arvensis* Fr.** On old dung, M.A.C., Aug.-Sept.

albicans Fr. In woods, M.A.C., Sept.

- Stropharia cornuilla** Bres. In woods, M A C, Rept.
ephyra (Pk) Atk. On Coprin. Reported by Kauffman to have been seen by Pennington 'as far west as Winnipeg, but Professor Pennington writes that the specimens referred to were found in 1913 on *Coprinus comatus* in Ontario north of Lake Superior probably at Whitefish Bay. Dr Pennington did not collect fungi in Manitoba, letter Dec. 7 1928. This parasitic mushroom may occur in the Province, but we have not yet seen it there.
semiglobata Fr. On Jung, M A C, Victoria Beach
 -- **stereocraus** Fr. On dung. Spores up to $24 \times 12 \mu$. Probably a form of the preceding
 (n) **umbonatus** Pk. Victoria Beach, M A C; Aug.-Sept.

(8) Melanospores

- Anellaria septaria** Karst. Omia, Victoria Beach, Norway House, M A C.
Coprinus stramentarius Fr. The Inky Cap is very common and widespread. Never coprophilous, but occurs around stumps over buried roots, etc., and is lignicolous. Described and fully illustrated by one of us (A. H. R. B., *Researches on Fungi*, particularly considered in vol. 3, chap. 9).
 -- **heri-lanatus** Buller (nomen nudum, *ibid.*, vol. 3, 308). Near *C. lagopus*.
comatus Fr. The Shaggy Mane is common, and has been described fully (*ibid.* vol. 3, chap. 9, vol. 1, chap. 19). *C. orestes* Schaef. as illustrated by Cooke in plate 689, is undoubtedly a starved form of *C. comatus*.
 -- **cordatus** Gable. Characterized by its heart-shaped spores, not uncommon as a coprophilous species coming up along with *C. curtus* and *C. ephemerus*, University of Manitoba.
curtus Kuehne (*C. phaeoloides* Buller, *ibid.* vol. 1, p. 87, to be discussed in vol. 4). Common on dung, very young pieces fox-y red, expanded pileus bearing minute reddish or whitish scales interspersed with cavate hairs, small disc finally depressed, spores deep black, cystidia absent.
 -- **lomatium** Fr (*ibid.* vol. 3, pp. 41-43, 338). A species somewhat similar in appearance to *C. micocrus*, found in woods on old logs, especially elm. Distinguished by the red oonium (*O. radione* Pers., *O. auricomum* Link.) which develops between the bark and the wood, and gives rise

in the fruit bodies. Spores numerous. Winnipeg M & L, cultivated in the laboratory. University of Manitoba. From pieces of corn bark. *T. velutina* Thore. Fr. in a variety of

Coprinus velutinus Fr. This name has been applied in the literature to several small, gregarious, gills with similar shape. We are using this name for the form which has pale fruiting surfaces on its stipe and gills and which produces a watery exudate at night and without exudate. Common. Winnipeg M & L. usually found in laboratory. Known from Europe.

Smaragdula Fr. Commonly reported in the literature as being *T. velutina* or *T. velutina* var. *velutina*.

Green-headed Hawk. *Smaragdula velutina* (Fr.) (p. 24). Not a separate differing entity, but having a somewhat greenish blue coloration of the lamellae and also in its young, immature, state. *T. velutina* Thore.

Immature Fr. Probably a form of *T. velutina* called, not *T. velutina*. Among leaves and grass in woods. M & L.

Woodwren. Thick. More or less like young cultures, University of Manitoba. Characterized by a distinct nodding in the lower or middle part of the stem. Pileus 1/2 inch wide with a white ring at first and a gray ring later up to 1 1/2 inch long. Gills present, gills crowded, gills 4-5-6-7-8-9.

Japan Fr. The white and conical pileus and the shape of the stem are like young. Known to Hosoya, from Aug. 20 (11-15) 1925 to be identical in Canada and England. Distinguished from the species which accompany it by the whitish hairy tuft of scales on the pileus.

European Fr. Not common in heating stude trunks in Europe and in North America including Manitoba. Very rare in laboratory cultures. Pileus phase of variable length sometimes almost 1/2 inch than those of *T. japonica* and as such seen in the field. Held together by a white thin subglutinous or in progress of disintegration. *T. japonica* (Fr.) (p. 24) for the purpose of *T. japonica* (Fr.) (p. 24).

Immature Fr. Common around roots of old trees, etc. and lignum vitae, etc. (p. 24). Known to Hosoya, from Aug. 20 (11-15) 1925 to be identical in Canada and England. Distinguished from the species which accompany it by the whitish hairy tuft of scales on the pileus.

Immature Fr. The old wet form of the laboratory. University of Manitoba, in 1912 and 1913. Known by the strong unpleasant odour and by the apparently unique

[illegible]

For example, the following table shows the number of people who have been convicted of a crime in the United States since 1970, by race and sex.

These findings have three important implications for the current literature. First, the results suggest that the literature has been somewhat inconsistent in its findings on the effects of the timing of the intervention. It appears that the effectiveness of the intervention is more likely to be observed when the intervention is implemented at the time of the initial outbreak, rather than at a later date. Second, the results suggest that the effectiveness of the intervention is more likely to be observed when the intervention is implemented at the time of the initial outbreak, rather than at a later date. Third, the results suggest that the effectiveness of the intervention is more likely to be observed when the intervention is implemented at the time of the initial outbreak, rather than at a later date.

[illegible]

15 μ long, bases of the short ones about 15 μ . Paraphyses about 20 μ wide and deep, usually four, sometimes five, around each basidium. Cystidia at the edges and scattered fairly uniformly over the sides of the gills, by individual, narrow in proportion to their length, 120-150 \times 20-30 μ .

Cultivation on horse dung has in laboratory cultures at the University of Manitoba, 1911 to 1928.

The species appears to be related to *P. pubescens* and its varieties. In it one the same kind of hairs on its pileus and of spores and stipes as species in the right. It is distinguished by its pileus being whitish brown rather than yellowish green at first, its spitting stellately and fairly regularly at the margin as it expands, and its being so strong a saprophyte that at last only the disc is left behind with liquid attached.

Conophila gracilis Berk. A slender umbonate form, probably belonging here, is not uncommon in coniferous woods, Victoria Beach (Mush), Sept.

reticulata Fr. Victoria Beach (Mush), Kenora, Aug. Sept.

nigrescens Fr. A species apparently this one, has been found several times at Kenora, Sept. Oct.

vinicolor Fr. Coniferous woods, Kenora, Sept.

vinosus Fr. *colombiana* Kauff. Kenora.

Psarocolla campanulata Fr. On dung, etc., Victoria Beach, M A C.

papilionacea Fr. Rich soil, M A C. Spores 13-17 \times 7-9, stem white, but the pileus hygrophanous. Fairly also at Victoria Beach.

reflexa Fr. Common. Kenora, M A C., Victoria Beach, etc.

solidipes Fr. On horse dung, Norway House, Winnipeg July-Aug. Sometimes also in laboratory cultures.

Pezizyella n. corrug. (Pers.) Fr. Kenora, Oct.

dissectata Fr. Not common, M A C., May-June.

PHALLACEI

Dictyophora Ravenelli (R. & C.) Hart. Common on old manure and waste from sawmills, Minaki, Kenora, Sept.-Oct.

Elaphoglossum (Huds.) Fr. Seed in once from garden and, Kildhorn, June.

HYMENOGASTRALES

Hymenogaster sp. was dug out of the soil, M A C., Sept. 30, 1924.

Rhizopogon rubescens Tul. Several specimens were found at Kenora partly exposed in sandy soil under *Pinus Bankiana*, Oct. 1, 1927.

LYCOPERDALES

Saviata pila H. & C. On the ground, M.A.C. Kenora. Spores 4 µ, without pedicels.

— **plumbea** Pers. In pastures, etc., M.A.C., Gimli, Kenora. Spores with pedicels.

Calvatia coelata (Hul.) Morg. Conch

gigantea Batel, Morg. Occasional, Gimli, M.A.C.

• **Hiacina** (Fr.) Quél. St. Boniface

Gaster corollatus Schaefl. A small species found around the base of *Abies balsamea*, Victoria Beach, Kenora.

• **delicatulus** Morgan. Recorded from Kenora.

limbelatus Fr. On ground in deciduous woods, M.A.C.

foeniculatus Hous. A specimen, examined by the three authors and almost certainly this species, was found by Mr. C. W. Lowe growing on a boulevard in the centre of Winnipeg.

hypomestricus Pers. Abundant on sand among conifers, Victoria Beach, Kenora.

perlanatus Pers. Occasional amongst balsam fir, Victoria Beach.

rubescens Fr. Deciduous woods, Winnipeg, M.A.C.

saccatus Fr. In woods, M.A.C.

triplex Jungb. Occasional, M.A.C., Indian Bay.

Lycoperdon cepastiforme Batel. M.A.C., Gimli, Norway House, Victoria Beach.

gemmatum Batel. Common, M.A.C., Victoria Beach, Chater, Kenora, Gimli.

— **periforme** Schaefl. Common everywhere on dead stumps, trunks, etc.

polytrichum Lloyd. Among moss, Pointe du Bois, M.A.C., Kenora.

• (n) **spadicum** Pers. Norway House.

— **substratum** Masson. On log in sand, Victoria Beach. Wrightii Bork. In a pasture, Gimli.

Myrobasium corium Devereux. Occasional among grass, M.A.C.

Section agaricoides (Corm.) Follies. Not uncommon along a grassy roadside at M.A.C., abundant on disintegrating grass seed, Morden, also at Gimli. Illustrated by Buller. *Researches on Fungi*, vol. 2, fig. 155.

NIDULARIALES

Crocidium vulgare Tul. Found once at Kenora.

Oyathus stereocrea (Schw.) de Toni. Not uncommon on old dung, M.A.C.

striatus Huds.) Hoff. Common on old wood, M.A.C., Kenora.

— *vinicosus* (Ball.) DC. (= *C. effe* Pers.) Common on soil everywhere.

Nidularia piliformis (Roeth.) Fird. On old wood, Kenora.

SCLERODERMATALES

Sphaerobolus stellatus Tode. On old wood, Kenora, on old cow dung M.A.C. (*ibid.*, vol. 5, to be published).

Tubosioma subitans White. Rare among grass, M.A.C.

— *campestris* Morgan. On sandy soil, Virden.

rubrum Lloyd. Among grass, M.A.C., Nov. Determined by C. G. Lloyd.

Uncertain

Pythogaster subiculosus Lloyd (*Mycological Notes* 87, vol. 1, no. 3, pp. 1143-4). This fungus has been collected a number of times, but we do not yet know much about it. Type collected at M.A.C. amongst grass in woods. Chlamydospores not observed by Lloyd or, so far, by ourselves.

FUNGI IMPERFECTI.

HYPHOMYCETES (MONILIALES):¹

Actinomyces seabrae (Thaxter) Gussow. On potatoes, Norway House and southward.

Alternaria Brassicae (Herk.) Sacc. On turnip, Morden and Brandon. In both localities only the variety 'Extra Early Purple Top Milan' was found infected. Spores large, 80-150 x 16-20 μ .

— *Solani* (E. & M.) J. & G. Common, but seldom very injurious on potato, the same or a similar species on tomato, egg plant, ornamental Nicotiana, Physalis, Statice, Amaranthus.

Aspergillus fumigatus Fresen. On old leaves, occasionally attacks young chickens.

— *glaucus* (L.) Link. Common as a mold in the herbarium and on moist debris. Sometimes passing into the Eurotium stage.

— *niger* van Tiegh. Has appeared in laboratory cultures.

¹ The Hyphomycetes parasitic on man and the higher animals are given in a separate list at the end of this section.

Isidellium Savin K. & R. Old wood, Victoria Beach. *I. Ellii* may be a synonym.

Isidysia Allen Mann. Sometimes important as a cause of decay of onions, Winnipeg.

Isidysia F. ex. Parasitic on lettuce, gooseberries, Rumex, strawberries, brussels sprouts etc. M. A. C. Valley River & *isidysia* Sav. & Hunt. 1861 paper wood. M. A. C. *isidysia* (C. G.) Desl. wood. M. A.

Isidysia F. ex. May be the species on apple & fully leaves. The genus Valley River. Spores 12-16 \times 10-12 μ .

Isidysia (C. G.) Probably the cause of leaf rot. M. A. C. & *isidysia* Sav. (C. G.) on alfalfa. M. A. C.

Isidysia Sav. (C. G.) on alfalfa. M. A. C.

Isidysia F. perhaps same as *I. eximia*. Injuring the tips of sunflowers, M. A. C.

Cephalothecium ramosum (C. G.) Is a very common mold, sometimes semi-parasitic.

Cercospora Lappulae Desmaz. and R. H. B. on up. Spots on leaves affected portions and finally the whole leaf brown. Tubercles on leaf from angustifolium short, solid, hyaline, at first scattered, becoming densely congregated and with the median white ring, resembling some kind of a square tubercle, with a hole like the brown when stained with Fungicide. Median hyaline straight, cylindrical, 2-septate, tapering off at ends on a line, tapering on a line, tapering on a glass under a 45 degree lens, tapering off and turning by the microscope, (very 20-40 \times), the longest ones somewhat 11 μ at the base and 10 μ at the tip. Parasitic on leaves and stems of *Lappula Lappula*. Berth Hill Manitoba. Sept. 4 1928. 1111 11 4 19.

Cercospora albicans Sav. Common on lettuce. M. A. C. Spores 40-55 \times 4-6 μ .

Ascochyta F. ex. Abundant on *Parthenocarpus*. M. A. C., France. 40-50 \times 4-6 μ .

Ascochyta F. ex. On *Lemnaea*. Norway House Berth Hill. 25-40 \times 3-4 μ .

Ascochyta Hunt. On *Polygonum*. St. Lawrence, Quebec.

Ascochyta Sav. On *Isidysia*. M. A. C. Berth Hill.

Collet F. ex. Hunt. On *C. polystachya*. Kansas. 44-50 \times 8-10 μ .

Conosporium F. ex. Hunt. On *C. pallida*. Grand Beach. 45-54 \times 3-5 μ .

Dothidea K. & R. On *Melilotus*, Brandon, Valley River. 34-100 \times 3-6 μ .

- Corticopora dubia** (Racc) Wint. On *Chenopodium*, M.A.C. 45-70 x 4-8.
- Lathyr** Deare & House. On *L. venosus*, Minaki. 30-50 x 4.
- **leptosperma** Pk. (*Corticopora leptosperma* (Pk.) Petrak.) On *Aralia*, Beauséjour. 60-90 x 2-3.
- **malvarum** Sacc. On *Malva*. Birds Hill. 50-100 x 4-8.
- **manitobana** Davis. On *Rhus glabra*, Gilbert Plains. 50-83 x 4-8. A specimen from Killarney has spores 52-80 x 5-8. "Shepherdia" in the original description should read "Kassagaitas" (29).
- **Menisperm** Gil & Holw. On *M. canadensis*, M.A.C. 40-60 x 5-8.
- Oxuli** (Pena) v. Hoelst. On *Viburnum*, Gilbert Plains. 35-50 x 2.5-3.5.
- **Osmorrhiza** E. & E. On *O. longistylis*, M.A.C. 40-80 x 4-8.
- passalocoides** Wint. On *Aster*, Birds Hill. 40-63 x 5-8.
- **Rhamnii** Felt (probably, resembles *C. asperginea* Ch. except in lacking green colour of hyphae). On *R. alata*, Beulah. 65-100 x 5-8.
- **rhina** C. & E. On *Tax. canadensis*. Thunder Hill.
- **roseicola** Pass. Very common on wild roses.
- (n) **rubigo** Cke. & Hark. On *Spiraea*, Minaki. 40-65 x 4-4.5.
- **Sagittariae** E. & K. On *S. latifolia*, Victoria Beach, Winnipeg. 50-100 x 5-7.
- squabidula** Pk. On *Clematis*, M.A.C. 35-45 x 4-5.
- subaeruginosa** E. & E. On *Unifolium* and *Vaccaria*; M.A.C. Treesbank. 20-40 x 3-5.
- **Symphoricarpi** E. & E. On *S. occidentale*, M.A.C., Carberry. 24-44 x 3-5.
- **umbra** E. & H. On *Bidens*, Victoria Beach. 50-100 x 5.
- **varia** Pk. On *Viburnum*, M.A.C. Spores up to 50 x 4.
- **Violae-tricoloris** Brisi & Cav. (probably identical with *C. Violae* Sacc.). On *Parry*, M.A.C.
- **zebrina** Pass. On *Trifolium*, M.A.C., Ste. Rose, Norway House. 60-120 x 4-6.
- Corticoporella Apocyni** (E. & K.) Trell. On *Apocynum*, M.A.C., Valley River, Lytham, Victoria Beach. 35-80 x 4-8.
- **cana** Sacc. On *Aster*, Berens River. 37-37 x 4-5.
- Corticoporella Gel** Dearness and Buby, n. sp. Spores pale at first, becoming red-brown, rather darker above, sub-

circular or irregularly quadrate, with a narrow red border, obscurely concentrically ridged, 3-5 mm. in diameter. Fertile hyphae in tufts, short narrow, hyaline on minute tubercles 23-40 μ in diameter, hypophyses common hyaline fasciculate, cylindrical or slightly wider below, closely rufescent, sometimes 1-3-septate, 28-37 \times 2-3-2-75 μ . On living leaves of *Quercus striatum*, M.A.C., Winnipeg July 3, 1928 2871 (D 5885). Collected also at Kadunoy and Oakville.

Carotosporella Neelias Decker and Baby, n. sp. Spots yellowish gray, subterranean, 0.5-2 cm. in diameter, bordered by a ridge and sometimes by a darkened diffuse area. Fertile hyphae amphigenous, more abundant below few to many in a tubercled form tuft hyaline, continuous, 10-30 \times 2.5-3 μ . Conidia hyaline, straight, seldom curved, mostly continuous, even to slightly obclavate, 30-75 \times 2.5-3.5 μ , mostly shorter than 50 μ . Sections from some of the spots might be taken for Ramaria. On living leaves of *Neelias paniculata*, Foxwarren, July 19, 1928 2921 (D 6880). Also collected at Brandon July 1 1928.

— **Pastinaceae** Karst. On escaped parsnip, Brandon, 40-60 \times 2-4.

Cladosporeum (n.) caducum Davis. On Betula, M.A.C. 14-18 \times 8.

— **carposiphium** Thum. Reported on plums at Morden.

— **cucumerium** E. & A. Injurious in greenhouse on cucumbers, St. Vital.

(n, spinosum) Cke. On old *Platanus*, M.A.C. Spores up to 25 \times 6.

— **fulvum** Cke. On tomato, sometimes destructive in greenhouse, Winnipeg. 10-20 \times 4-6.

graminum Cda. Common on wheat, rye, and other grasses.

— **herbarum** (Pers.) I.k. Common on moldy bundles of cereals and on other substrata.

subsessile E. & B. On Populus, Norway House, M.A.C. Lydiate. 13-20 \times 5-6.

— **Typhae** Desm. On old *Typha latifolia*, M.A.C. 20-28 \times 7-8.

Cladotrichum polysperum Cda. On old wood, M.A.C. 15-17 \times 10-11. The mature stage *Chaetophactria fusca* not found.

Oenothecium betulinum Cda. Twigs of larch, Indian Bay.

affusum Cda. On old wood, M.A.C. Spores in clumps.

- Coronium coprophilum** B & C On old dung, M.A.C. 9-10
× 4-5.
- Dactylum dendroblet** (Bolt) Fr (probably a stage of *Hypomyces rosellus*). On *Polyporus tomentosus*, Munk. 30-40 × 10.
- Didymaria didyma** (Ung.) Schroet On Anemone, Morden. 20-23 × 6-8.
- Entomosporeum maculatum** Lév. On Sorbus, Brandon, I. L. Connors.
- Eurosporum Tillae** Lenz. Abundant on dead Tilia branches, M.A.C.
- Fumago vagans** Pers On honey dew on leaves, Dauphin, M.A.C.
- Fusarium** **Bates** (Down) Sacc. Reported by Henry (Minn Tech Bull, 22 18, 1924) from soil, Brandon.
- **caeruleum** (Lib) Sacc. Commonly causes rot in potato tubers.
- **conglutinans** Callisleght Beach. Destructive to cultivated Asters, M.A.C. and elsewhere in the Province.
- **culmorum** (W. G. Sm) Sacc. Occasionally causes wheat scab, M.A.C.
- **discolor sulphureum** Schl. A fairly common cause of potato rot.
- **graminearum** Schwabe (stage of *Gibberella Saubornii*). Not uncommon on wheat.
- (n) **lateritium** Noss. On ash twigs, M.A.C.
- Lilii** Botley. Often injurious in lily buds.
- **Lycopersici** Sacc. Perhaps the cause of a tomato wilt, not common.
- Martinii** P. H. Jones. Common cause of root-rot of peas.
- **moniliforme** Sheld. From Brandon soil, A. W. Henry (see *F. Bates*).
- **Negundoana**, Sterb. Red stem of box-elder, common, M.A.C.
- **oryzorum** Schl. Frequently causes potato wilt.
- **pyrochroum** (Down) Sacc. On Acer twigs, perhaps also on Salix, Winnipeg, M.A.C.
- (*Fusarium* spp. have also been found causing root rot of soybeans, sweet clover, alfalfa, and oats, and also a rot of dily bulbs.)
- Puccinellium depressum** (B. & Br) Sacc. On Sown, M.A.C. 36-44 × 4-8.
- Sandriothecium** (Wallr) Fekl. Stage of apple scab. Common but not serious, M.A.C., Morden, Valley River, etc. The *Venturia* stage not yet detected.

- Phaeobotium radiorum** (Lib.) Lund. (*Napocladium Tremulae*).
Often injurious to leaves of *Populus tremuloides*, Norway
House, Swan River, M.A.C. 20-30 x 5-8.
- Glomerularia Corni Pk.** On *Cornus canadensis*, Victoria Beach.
Lonicerae Pk.; Deane & House. On *Lonicera*, Birds Hill,
Portage & Prairie. Spores 4 μ , rough.
- Orapium stercorarium** March. On horse dung, M.A.C.
5-8 x 3.
- Heterotrichum linearis** Pk. (or a variety). On *Phragmites*,
Dauphin.
- Harposporium Angellulace** Lohde. This fungus which so far
as we know, has been reported only by Lohde and Zopf in
Germany and by Sorokin in Russia, was found in quantity
in horse-dung cultures in the laboratory, University of
Manitoba. It was killing hundreds of larva, nematodes
which were swarming on the dung and the sides of the
glass container seven to fourteen days after the fresh
dung was placed in the culture. From the hyphae in
the nematodes, basidium like structures grew outwards
and bore the characteristic sickle-shaped conidia.
- Helleocon Barkleyi** Curt. Old poplar, M.A.C. Spores 4 μ
wide, in coils 20-25 μ wide.
- **polysporum** Mory. Variety on old poplar bark, sometimes
abundant, M.A.C. Differs from the type in having a
brown rather than a rose colour. Spores in coils 15-18 μ
wide.
- Helleocon ellipticum** (Pk.) Mory. On an old board, M.A.C.
Coils 25-35 x 14.
- Helleomyces gracilis** Mory. On dead poplar, M.A.C. 60-80
x 11-18.
- Helmithosporium Avenue-sulvace** (H. & Cav.) Lund. On oats;
M.A.C.
- (n) **fusiforme** Che. On dead oak wood in a hollow trunk,
M.A.C. 25-35 x 8-10.
- **gramineum** Rabh. Often injurious to barley.
- macrocarpon** Grev. (or a variety). On oak branches;
M.A.C. 90-120 x 17-18.
- (n) **parvulus** Che. On an old barrel stave, M.A.C.
Perhaps a stage of *Pyrenopeziza rugosa*.
- **silvum** P. K. & B. Very injurious to roots of cereals.
Rare Sacc. Not uncommon on barley leaves.
- Heterosporium** (n) **Avenue** Oud. Associated with "Fusoid
streaks" on barley leaves, M.A.C. 18-28 x 9-11.
- **gracile** Sacc. (stage of *Didymosphaeria Iradae*). Common on
Iris. An examination of the Iris garden at the Morden

- Puccinia cynuspis* Link. Common on apple.
- Puccinia grisea* (Cha.) Sacc. On *Chaetochloa*, *Sorghum*, *Nasipawa*, M.A.C.
- Polythrincium Trifolii* Kze. Common on clover. Norway House, Valley River, M.A.C.
- Ramularia Actaeae* Ell & Harkn. On *A. rubra*, *A. alba*, Eleni, Norway House. 20-30 \times 4-8.
- *anomala* Pk. On *Potentilla*, M.A.C. Agrees with co-type specimens. 10-15 \times 1.5-2.
- *Artemisiacae* Fekl. On horse radish, Valley River, Carman, Kenora. 15-25 \times 2-3.
- Artemis* Sacc. On *Potentilla*, Brandon Valley River, Norway House, M.A.C. 15-22 \times 4.
- Ramularia coccinea* Dearness and Harkn. n. sp. Amphigenous on reddish-gray irregular areas. Fertile hyphae hyaline, in numerous dense tufts 30 μ high whitening the spots. Conidia hyaline, cylindrical, continuous to 2-septate, 10-50 \times 4-8 μ mostly about 30 μ long and 1-septate, sometimes catenulate. On living leaves of *Castilleja coccinea*. Between Robson and Grandview, July 20, 1928. 3876 (D) 6672. Differs in the spots and in other respects from *P. Castillejae* K. & L.
- *Delavayi* F & M. On *C. arvensis*, M.A.C. 15-22 \times 4.
- corcorporoides* K. & F. On *Chamaenerion*, Vista, Norway House, Foxwarren. 15-20 \times 4-5.
- clinoides*. On *Tiarella*, Minaki, Pointe du Bois. 20-25 \times 2.
- *decipiens* E. & E. On *Rumex*, Oakville, Dauphin. 15-25 \times 2-4.
- Herschel* (Oud.) Sacc. On *H. lanatum*, M.A.C., Lydiatt, Dauphin. 22-25 \times 4-5.
- *leucophila* Davis. On *Vicia*, Dropmore. 22-25 \times 4-5.
- *Lappulae* Davis. On *L. deflexa*, M.A.C., Trevelack. 14-22 \times 4.
- (n) *Lymnastichia* Thum. On *Strophanthus*, M.A.C.
- *Magnusiana* (Sacc.) Lindau. On *Trifolium*, Berens River. Spores 20-25 \times 4, 1-septate.
- Pastinacae* Bask. On parsnip. Winnipeg. 22-30 \times 2.
- punctiformis* (Rehl.) v. H. On *Epilobium*, Victoria Beach. c. 30 \times 2.
- rosa* Fekl. On *Salix*, M.A.C. Vista. 15-21 \times 2-5.
- *Endochiae* Pk. On *R. lacustris*, Dauphin, Beausjour, Portage la Prairie. 20-47 \times 1-5.
- *rubro-maculosa* Pk. On *Polypodium* and *Potentilla*, M.A.C., Valley River. 10-14 \times 2-5.

Ramularia repum Desvries and Buby n. sp. Spots sub-circular to angular 5-8 mm in diameter tan on both sides of leaf, bounded by the venetia or by a raised border surrounded in most cases by a narrow translucent rim bearing at the line of confection rather thickly scattered epiphyllous perithecia of a *Septoria* with spores $11-15 \times 1 \mu$. Fertile hyphae typophyllous, much branched hyaline elongated $2-7.5 \mu$ wide septate. Conidia hyaline single or loosely grouped catenulate, narrowed distally, one-septate mostly $15-25 \times 3-4 \mu$. On young leaves of *Cornicular repum* Moravia, Ontario, Sept. 21, 1928 40., 1) 4-7). Possibly the same as *Cornicular tuberculata* J. J. Davis, and probably related to the *Septoria* on the spots.

colubra Felt & Harkn. On *Rhus*, M.A.C. 20-25 x 3-4 B.

Tanacet Lenz. On *T. vulgare*, M.A.C. Reported in Colorado. Spores $11-20 \times 4-8$.

Tanacet Kunt. Very common Norway House, M.A.C.

Tanacet Sacc. (stage of *Myrothecium Fragariae*). Common Norway House. Discovered M.A.C. 20-45 x 3-4. Hedberg and Lenz state that they found this only on hermaphrodite plants not on female ones.

umbra Davis. On *Umbellula*, Ingolf W.N. Dunlop. 8-18 x 3-3.

Urtica Ue. On *Urtica procumbens*, M.A.C., Dauphin. 14-24 x 3.

Viburni K. & K. On *V. opulus*, Gilbert Plains. 13-26 x 2.5-2.

virgatus Thum. On *Solidago*, M.A.C. Winnipeg Beach. 13-20 x 3-4.

Winnetona Boland Kuehn. Abundant on potatoes, also on tomatoes, caribgar candytuft sweet pea. Norway House southward.

Rhynchosporium Alismatis (Died.) Davis. On *Alisma* and *Pagitaria*. Rosevear. Birds Hill M.A.C. 14-25 x 3-4.

Sclerotium Delphinii Webb. Injurious to caribgar, Winnipeg, M.A.C.

Sclerotium Clavicularum (Thum.) Sacc. On *Clavaria*, Kenora. 14-25 x 6-8.

graminis Felt. On timothy, Creston, D. L. Bailey. Perhaps common.

Scopularia Populi Desvries and Buby n. sp. A brownish black mold on old bark. Fertile hyphae erect, septate, brown, 8-10-8 mm. long, 8-9 μ thick at base, narrowing to

4-5 μ below the prescissately branched or subcylindrical, conical- or mucous-covered head (conical wood, 3-4 \times 2 μ). On dead bark of *Populus* sp. May 22, 1924, M.A.C. 2302 (D. 4034).

Epidermium chrysosporum Fr. On bark, wood, spores, M.A.C., Kenora.

Leptocylindrium compactum F & H: Hark. On *Podium*, *Deschamps*, M.A.C. Hark. Hark. 90 27 4 4.

Sporocylindrium strictum Hark. On *podium* M.A.C. Hark. *strictum*.

Sporodermium compactum H & L. On twigs of ash and larchwood. M.A.C. *Sporodermium*.

Sporotrichum Peck Ph. On old *Populus* *strictum*, M.A.C. 14-16.

Stilium parvum L. & F. Old wood. M.A.C. 4 : 1 3.

Strombosia Hark. On decaying potatoes. M.A.C.

Streptotheca Hark. On twigs of *Populus* *strictum*. Hark.

Trichoderma hyarum Tuck. Hark. Common on old wood. 3-4.

Trichosporium parvum Thaxter and Hark. n. sp. Spores reddish at first then yellowish, or even above sandy gray brown. On the surface of the hyphae and spores, yellowish when these are removed, subround to angular, 2-3 μ diam. Hyphae hyaline, long, septate, irregularly branched for many times, the apices of ascending, attenuating 0.2 μ in length 2-3 μ thick. Conidia roundish, subglobose, smooth, hyaline, with a thin, elliptic, slightly reticulate wall 0.14-0.16 μ thick. On living leaves of *Deschampsia* *strictum*. Hark. 14-16. On living leaves of *Deschampsia* *strictum*. Winnipeg, Aug. 24, 1922. J. L. Hark. Also collected Sept. 18, 1921.

Trichothecium subulturnum Ph. Spores subulturn, not certain. On old wood. M.A.C. 22 27 10 14.

Trichostema americanum Thaxter. Common on *Podium*, *Deschampsia*, *Populus*. M.A.C. Valley River, old *Populus* etc. Above spores are minute and unobstructed, cannot be distinguished in the field. It may also be present.

Tuberaria vulgaris Tuck. Common on *Deschampsia* *strictum*, 5-8 \times 1-2.

Verticillium albo-atrum M.A. On rotting potato tubers. It has not been found to cause potato wilt in Manitoba.

Lactaria Ph. On *Populus* and *Lactaria*. Victoria Beach, Hark.

Volutella n. n. (A & B) Fr. On old ash canoes and others. M.A.C. 12 : 2.

- Cylindrosporium Artemisiae** Doorn & Barth. On *A. grapholider*, Roblin, Dauphin 50-70 \times 3-4.
- **Glematella** E. & E. On *Glemata*, Bethazy, R. C. Russell.
- **crascentum** Barth (*Septopodium crascentum* (Barth.) Doorn in lit. On pecanip, Winnipeg 50-70 \times 5-8.
- **Heraclei** E. & E. On *H. lanatum*, Lydiate, Winnipeg Beach 40-70 \times 3-4.
- **hiemalis** Higg. Common on *Prunus pennsylvanica*, Norway House and southward 40-65 \times 3-4.
- **intescens** Higg. On *Padus virginiana*, Norway House.
- **granophorae** Higg. On plum, Morden 40-55 \times 4. According to Higgins the three preceding species mature to *Coccosporium* spp.
- **salicifolia** (Trot.) Davis. On *Salix*, Neepawa, Berens River 40-60 \times 2.5-3.5.
- **shibicum** Doorn & Busby (*Mycologia*, 20: 245). On *Apocynum*, Pierson, V. W. Jackson 22-45 \times 2.75-3.25.
- **Thalictri** E. & E. On *Thalictrum* sp., Lydiate 40-80 \times 2-3.
- **Toxicodendri** (Curt.) E. & E. On poison-vy, Victoria Beach 40-70 \times 3-4.
- Gloeosporium Betulae-papyriferae** Doorn & Overh. On birch leaves, Morden, Kenora 3.5-5 \times 1.75-2.
- **Chamaedaphnia** Doorn. On *C. calyculata*, Kenora 15-18 \times 7.5.
- **confusum** E. & Doorn. On *Sagittaria* M. A. C. 8-12 \times 3-4.
- **Coryli** Doorn. On *Corylus rostrata*, M. A. C. 14-20 \times 5-7.
- **Equiseti** E. & E. On *R. sylvaticum*, Oakville 35-60 \times 3.
- **Polygoni** Doorn & House. On *Tricoman*; Minaki 4-8 \times 2.
- **Psoraleae** Fl. On *P. esculenta*, Camp Hughes; W. L. Gordon 17-22 \times 4-8.
- **Ribis** (Lab.) Mont. & Doorn. On *R. odoratum*; M. A. C. 10 \times 6.
- **Salicis** West. On willow, Morden 14-18 \times 6-8.
- **symphitum** Trinch. On *Ficus*, University of Manitoba, T. C. Venterpool 11-16 \times 6-8-8.5.
- Gloeosporium spadicum** Doornos and Busby, n. sp. Spots dark brown, irregularly elliptic, mostly appearing to start at the margin of the leaf and to progress along the veins, 5-10 \times 2-4 mm., sometimes spreading over half the leaf. Acervuli deep-seated, sometimes raising the surface into a

petiole up to $80\ \mu$ high before rupturing it, subglobose, $50-140\ \mu$ in diameter, opening apically. Contents hyaline, cartilaginous, cylindrical, $3-4-1\ 2\ \mu$, in long, persistent conical spores $23-30-0\ 3\ \mu$. Parasitic and injurious to leaves of *Trifolium pratense*. Brios Hall, Sept. 18, 1929. G. R. Bailey W. F. Hanna, T. Johnson, 1922-31 4124), also collected at the same location, July 1, 1927.

Stecoporus brachylopus Rees. On Acer, Victoria Beach $3-5 \times 1\ 5-2$.

var. n. sp. Sometimes occurs on raspberries, but is not common.

Marasmius Aquilegiae Liessens, n. sp. Spots dark coloured, gray or paler in the centre, becoming thin, brittle, fugacious, subcircular angular but paler below. Scarcely concentrically ridged. $0\ 5-1\ 0\ \text{cm}$. Acreous thickly scattered nearly conical, inside visible in both sides, probably opening apically above. $60-200\ \mu$ in diameter. Contents hyaline, cylindrical ends rounded, 1-septate, $8-15 \times 4-6\ \mu$.

On living leaves of *Aquilegia vulgaris* (Horn, New York Oct. 7 1920. G. R. Barnham 112 (1) 1920, type), Winnipeg Manitoba, G. R. Bailey 1923.

Cantharus D. & M. Rees. On poplar not common, M.A.C., W. L. Gordon. $17-20 \times 4-6$.

Marasmius Rees & F. H. On oak common, M.A.C., Morden, Carberry. $14-24 \times 3$.

— **Potentilla** Down. Frach. On wild strawberry, not common, M.A.C.

— **Juniper** Down & Bailey. Mycologia, 20 242. On scotch thistle, common M.A.C., Morden, Gladstone. $10-13-3\ 2$.

Helicoverbia parvulus Ph. On Prunus, M.A.C. $18-21-10-17$.

— **parvulus** Down & North. On Betula, Victoria Beach.

Monochaetia, probably identical with *Pantaleonea canadensis* Labrousse. On elm bark, common M.A.C. 30×9 .

— **Eriogasterium** Dore. On *Thamnospermum* Robins. I. L. Connors. $11-16 \times 4$.

Pantaleonea media Liessens and Bailey n. sp. Acreous thickly scattered black subcircular somewhat protrusate, the thin apogamous layer lining the roof as well as the floor lenticular $150-300\ \mu$ in horizontal diameter $150-300\ \mu$ measured vertically. Contents subulate, beak-like, 4-septate, in water swelling like so many pedicled insects, and cells only slightly greater than the three, uniformly pale-

brown, intermediate cells, total length 26-27 μ , width 4-5 \times 5 μ , intermediate cells each 5-6 μ in length, the two equal divergent setae 10-20 μ long.

On dead stems of *Viburnum Opulus*, Winnipeg, Manitoba (M.A.C.). May 1926, 2557, April 1927, 3556 (D. 632J).

Peridermium perisoides de Not. f. *longistata* Dearness, new form.

On stems of *Symphoricarpos occidentalis*, M.A.C. Some of the setae are 60 μ long or nearly twice the length of the spore body.

Septogloeum Apocyni Pk. (*Stagonospora Apocyni* J. J. Davis, *Parasitic Fungi of Wisconsin*, No. 6, p. 230, *Dearnessiana Apocyni* Bulak, *Herb.* 58-59). A form on *A. rubricol* at Valley River has spores 26-50 \times 8-10 μ .

Fragariae (Br. & Har.) v. H. On *Comarum*, Norway House. 34-44 \times 5-6.

rhopaloides Down & Bishy, (*Mycologia*, 20: 243). On *Populus* common at M.A.C. Spores 40-60 \times 8-12 μ , the middle cell largest 21-30 \times 4-12 μ .

EPHAEROSPIDALES

Actinostema Roseae (Lab.) Fr. A stage of *Deplocarpon*. On roses, Dropmore, Morden. 18-22 \times 5-6.

Ascochyta compositarum Davis. On *Helianthus*, M.A.C. 10-15 \times 3-4.

graminicola Sacc. On *Agropyron*, *Panicularia*, M.A.C., Buncloody. 18-40 \times 3-4.

— ***infusans*** F. & E. On *Ranunculus*, Brandon. 12-17 \times 4-5.

— ***Medicaginis*** Brca. On *alfalfa* stems, M.A.C. 10-14 \times 4-5.

Majoli (Frid.) Davis (*A. cochlearia* Laub.). Common and sometimes injurious on sweet clover. 12-20 \times 4-6.

parasitica Fawc. On stems of hollyhock, M.A.C. 9-11 \times 3-4.

— ***Plat.*** Lib. On pea and vetch, Winnipeg, M.A.C. 12-15 \times 4-6.

Rhei F. & E. On rhubarb, Lydiate, M.A.C. 11-20 \times 3-5.

— ***Thapsi*** F. & E. On Zinn, M.A.C. 22-26 \times 6-7.

Asideroma Gentianae Fekl. On cracked gentian, M.A.C.

Bruchiae Sibiricae (F. & E.) Petrsk. On *S. angustifolium*: Brandon. Spores 18-25 \times 3-5 μ , with an awn.

Camatosporium Amorphae Sacc. On *A. fruticosae*, M.A.C. 20-26 \times 9-11.

Camatosporium (n) ***cruciatum*** (Frid.) Sacc. Pyrenes thickly scattered in the cortex from which small perithecia arise.

and rupture the epidermis revealing the merely punctate black ostia, 150-170 μ in diameter. Conidia brown, septation mostly revolute, 8-9 \times 3-4 μ . On dead twigs of *Ulmus americana*; M.A.C.

Canthareporium s: *Ques F. Hens*. Perithecia thickly scattered, covered by the epidermis which is ruptured in small patches over the ostia, hemispherical form and black in transverse, 175-200 μ in diameter. Ostia with short papillae or sometimes merely perforate. Conidia dark-brown, elong with rounded ends, mostly 3-septate with one longitudinal septum, 14-20 \times 4-6 μ on hyaline conidiophores 8-12 \times 2-3 μ . On dead 'water sprouts' of *Fraxinus pennsylvanica*; M.A.C. Winnipeg.

Colletia torpida Fr. Lower On *Corylus*; M.A.C. 20-24 \times 3.

Clavospora Cassii de Hary. On *Podocarpus*, etc.; M.A.C., Yacht Haven. Spores sometimes attaining 3 or 4 μ , mostly 4-7 \times 3 μ .

Conothyrium Puchellii Racc (stage of *Leptospheria*). On *Rhus*; M.A.C. 2.5-4 \times 3.5.

olivaceum Hens (or one of its varieties). On *Vitis*; M.A.C. 4-6 \times 2-3-3.5.

- **pyrenum** Racc; Rhod. On apple leaves, Morden. 6-6 \times 3.

- **Tomaria** (Hed. On *Tamarix*; M.A.C. 5-7 \times 2-4.

Cryptosporangia cerulea (Ph.) Petr. & Syd. On *Cornus*; M.A.C. 20-24 \times 10-15.

Cryptospora anthracis Racc (*Falsa anthracis*) Common. 4-10 \times 1-3.2.

- **assulata** L. & L. On *Acer Negundo*; M.A.C. 2 \times 1-1.5.

- (n: *Cyperus* Fekl. On *Salix* twigs; M.A.C.

- **chrysosporus** Fr. Common and often injurious on poplar; M.A.C. 4 \times 1.

- **Salix** Racc. On where Winnipeg. 5-6.5 \times 1.

Dactynia glauca H. v. Cast. Common on *Menisperm.*, *C. rostrata*. Perithecia, but seldom important in checking the development of roots of greenhouse plants. 12-17 \times 4-5.

Dicranosporium Relbuniae (var. *communis*) on old wood; M.A.C., Indian Bay. 6-8 \times 2-3.

Diplodia Amorphae (Wall.) Racc. Common on *A. fruticum*; M.A.C. 20-27 \times 2-11. Possibly a stage of *Curatularia elongata*.

- **Russellii** Fekl. On *H. lupulus*; M.A.C. 20 \times 10.

maehreni Fekl. (*Sphaeropsis maehreni*) On *Prunus*; M.A.C. 20-25 \times 10-12.

- **maehreni** Lév. On elm twigs; M.A.C. 20-25 \times 6-10.

- Diplodia sarmentorum** Fr. (may be *D. petolarum* Fr.). On *Monospernum*, M.A.C. 21-26 x 4-12.
- **Zea** (Schw.) Lév. On overwintered maize stalks, M.A.C. 24-30 x 6. Parasitic in the corn belt of the U.S.A.
- Diplodia Ellisi** Sacc. On old *Chenopodium*, M.A.C. 16-22 x 7-9.
- **Salicis** West. On dead willow branches, M.A.C. 16-22 x 3-4.
- Diocoria arctocreas** Tode. On old leaves of *Rubus* and *Populus*, M.A.C.
- Heterospora diatrypoides** K. & B. On old fungus on wood, M.A.C.
- Heterospora Mah Thuen.** A form on leaves of *Amelanchier*, M.A.C. 12-15 x 4-5.
- Heterospora Viburni** Dearness and Selys, n. sp. Pycnidia dark-brown, superficial, patellate or shallow cup-shaped, 0.5-0.7 mm. in diameter at top, 0.25 mm. deep. Conidia hyaline, sub-fusoid, nucleate at each end, 3.5-5 x 2.25-2.5 μ . On compound, dendroid or fasciculate coniospheres forming units about 0.5 mm. long. On dead but firm branches of *Viburnum Opulus*, Feb. 28, 1928, M.A.C., W. L. Gordon. 2552 (D. 6127).
- Leptostroma carolinum** Fr. On old *Carex*, M.A.C. 18-24 x 3.
- **Illigiosum** Deem. Common on stipes of *Pteritis*, M.A.C. 8-8 x 1.5-2.
- Macrospora Salicis** Dearn. & Barth. On willow twigs, M.A.C. 12-24 x 7-8.
- Microdiplodia** sp. (probably a stage of *Thyridium amblyum*). On elm, M.A.C. Spores 7-12 x 4-6 μ . A similar species with spores 8-12 x 4-5 μ is also common on *Prunus*.
- Micropera drupacearum** Lév. On *Prunus*, M.A.C. 25-50 x 3.
- Phaeospora Anemones** Ell. & Kell. On *A. cylindrica*, Rose-vain. 40-50 x 4-5.
- **canadensis** Bubak & Dearn. On *Acer*, Victoria Beach. 25-55 x 2-3.
- Phoma herbertella** Sacc. & Syd. On barberry, M.A.C. 4-6 x 2-3.
- **Belae** Fr. Causes rot of beet roots, M.A.C.
- **Corni-suetiae** (Fr.) Sacc. On *Cornus*, M.A.C. 3-4 x 1.
- **destructiva** Piov. On tomato fruit, M.A.C. 4-8 x 2-3.
- **fumosa** E. & E. On *Acer* twigs, M.A.C. 6 x 3.
- **herbarum** West. On rhubarb, M.A.C. 4-6 x 2.

Phyto. Infus. (Tide, Dene Reported on woodhollow, Wm. Fyfe

- **longissima** (Pers.) West. On stems of *Chenopodium*, common, M.A.C.

Monospor. Ph. On dead stems of *M. canadense*, M.A.C. 7-9 x 2-2

signatocolla Thwait. On immature of *Aster*, M.A.C.

Frans. Ph. On *Franseria* sp., M.A.C. 4-8 x 2-2½

Phytotheca abartica Ed. & Reel. On *Monosporium*, M.A.C.

Spores 3-6 x 1-2. Tuberc. and Infus. *Mycologus*, 10: 110 + stated that this should be also *Phytotheca monosporica* T. & G. and that a septum in smaller spores should be called *P. abartica* T. & G. T. & G.

Phytotheca Pers. On hollyhock stems, M.A.C. 3-7 x 2

Astericola T. & G. On *A. major*, M.A.C. 4-8 x 2-2

Berberidis Rabb. On harkness leaves, M.A.C. 4-8 x 2-2

Ischa (Reel) On harkness and mangro, M.A.C.

Ischa T. & G. On harkness leaves, M.A.C. 4-8 x 1

Ceras. T. & G. Near the *Ceras. capensis*, Norway House 4-8 x 2

circumscissa (Reel) On sweet cherry, Morden, 4-8 x 1-2

- **Circumscissa** T. & G. of *P. baldensis* Mamm. On *Franseria*, M.A.C. 4-8 x 2-2

Corymbosus Pers. On *Vaccinium*, M.A.C. (Thompson)

Phytotheca. Ceras-canadensis Thompson and Bailey n. sp.

Spores scattered numerous small 1-2µ in diameter, white with a pinkish red color similar but paler below. *Pyrenaria* spores are much about 50µ in diameter perforate, smooth 15µ x 1µ in shape triangular with obtuse rounded ends somewhat flattened, striate, 2-3 x 0-75µ. On living leaves of *Cornus canadensis*, Victoria Beach, Manitoba, June 25, 1928 (J. K. Bailey, J. L. Thompson and T. Johnson, 1928 (P. 6624); *Pyrenaria* like *P. Northensis* Pers. & Syd. but spores and apoth. quite different.

serotus T. & G. On *Aster* sp., M.A.C. **Spores** 3-6

1-2µ as given in N. & P. Flora 4: 62 but this *Phytotheca* may be a sporangium stage of *g. l. mycelium*.

Cristati Pers. Near the harkness, M.A.C. 2-4 x 1-2

Dactylos Pers. On *Rubus*, Victoria Beach, 4-8 x 1-2

- **Ischa** T. & G. On *Monosporium*, M.A.C. 4-8 x 2-2

- **Dactyloceph.** (Reel) & Bailey *Mycologus*, 10: 362

(Thompson and Thompson) on Manitoba, M.A.C., Berlin, Kilmory Lybott 7-10 x 2-2 x 2

- Phyllactis Heraclei** Ell. & Dearn. On *H. lanatum* ; Dauphin. 4-6 \times 2.
hispidula Ell. & Dearn. On *Smilax*, M.A.C. 3-4 \times 1.
 — **innumerabilis** Ph. On *Amelanchier* and *Padus*, Minaki, M.A.C., Vista. 5-7 \times 1-2.
intermixta Seaver. On poplar leaves, M.A.C. 6-6 \times 1-2.
ivaeicola E. & E. On *Iva*, M.A.C., Dauphin. 4-10 \times 2-3.
Lappae Sacc. On *Arctium*, M.A.C.; W. L. Gordon. 6-8 \times 3.
 — **Lentiginis** Sacc. & Syd. On *Viburnum*, M.A.C. 4-6 \times 3.
Lirida E. & E. On oak leaves, M.A.C.
 (a) **Lychnidis** K. & S. On *L. chalcidensis*, M.A.C., Brandon. 6-10 \times 4. Perhaps *P. Durochi* West. in part.
 — **minima** (B. & C.) E. & E. On *Acer*, Victoria Beach, Minaki. Circ. 6 \times 2.
minutissima E. & E. On *Acer spicatum*, Minaki. 2-2.5 \times 0.5-1.
 — **Negundinis** Sacc. & Spag. On *Acer*, M.A.C. 8-9 \times 3-4.
 — **phomiformis** Sacc. On oak, Victoria Beach, M.A.C., Carmen. 14-22 \times 6-8.
plantaginicola Tolon & Danels. On *Plantago*, M.A.C., Dorcas, Brandon. 8-14 \times 2-4.
 — **Rodbeckiae** E. & E. On *R. laciniata*; Dauphin. 6-10 \times 2.5-3.
smilacina (Ph.) Dearn. On *Smilax*, M.A.C.
spermoides Ph. On *Vitis* and *Celastrus*, M.A.C. 3-5 \times 1.
 — **straminea** Broe. On rhubarb; Brandon, M.A.C. 19-29 \times 4-5.
Tiliae Sacc. & Spag. On *T. americana*, M.A.C. 3-7 \times 2-3.
Violae Dearn. On *V. canadensis*, Killarney, Gilbert Plains. 4-8 \times 1.5-2.
 — **virginiana** (Ell. & Harkn.) Seaver. On *Padus*, M.A.C., Neepawa. 8-8 \times 1.5-2.
viridis E. & E. On ash, M.A.C.
 — **viticola** B. & C.) Thum. On *Parthenocissus*, Koorara; W. L. Gordon. Circ. 10 \times 6.
Piggolia Praxii B. & C. Common on ash leaves, M.A.C.
 — **Negundinis** Ell. & Dearn. On leaves of *Acer*; M.A.C. 3-4 \times 1.
Placophæria punctiformis (Fekl.) Sacc. (stage of *Pseudopeziza*) On *Gelseum*, M.A.C., Birds Hill. 2-3 \times 1.
Pyrenochaeta (a) **crysipheides** Sacc. On *Cirsium* stems, M.A.C.

Rhizomorpha Solingiana (C & E.) Sacc. On stems and galls of old goldenrod, Brandon. 22-34 x 2-3.

— **subgrisea** Pk. On stems of Solingia. M A C. Cres. 70 x 2.

Rhizomorpha Viburni-Opuli Dearness and Babry, n. sp. Pyrenia scattered, subreticular, cone hemispheric, 17-23 μ in diameter, wall pale, very thin. Conidia hyaline, continuous, non nucleate, curved or sometimes straight, 20-40 x 11-15 μ . Sporiferous layer lining the wall about 15 μ thick. On dead stems of *Viburnum Opulus*, M A C. Winnipeg, May 3, 1924, 2:25 D 4060. Common and possibly a stage of *Dudymella canadensis*. *R. interrupta* (H & C.) Sacc. on this host is described with multiseptate spores 50 μ long, *R. apulmonia* Fauts. has spores 40-60 μ long.

Septaria abortiva (E & E.) T & D (see *Phyllosticta abortiva*). May occur as a distinct species. M A C.

— **Agropoli** Deem. On *Umschhuia*, Winnipeg. Spores 40-65 x 3-4 μ . Pyrenidium wall imperfect.

(n) **Agropyri** E & E. On *A. teretis* at Morden, J C Dark, and on *A. Richardsonii* at Roblin, I L Connors. Spores 27-65 x 2-3 μ . See Weber, *Phytopathology*, 13: 3.

— **abulata** E & E. On *Alnus*, Norway House, Valley River, Birds Hill. 40-64 x 2-3.

Atkinsonii Deem. On *A. canadensis*, Brandon. 12-28 x 1-2.

-- **Apli** Chester. Often destructive on celery. M A C, Miami. Morden.

Astragal Hub. On *Lathyrus*, Victoria Beach, Minitaki, etc. Spores 40-75 x 2-3 μ . *Phaeospora reticulata* E & E appears to differ only in having spores somewhat thicker and sheathed with muricage.

Atripurpurea Pk. Common on *Aster*, Minitaki, M A C, Morden. 60-110 x 3-4.

— **aurus** E & E. On *Ribes odoratum*, sometimes *asperum*; M A C. Brandon.

— **Avesae** Frank (stage of *Leptosphaeria*). On oats, Brandon, I L Connors. 20-36 x 3-4.

Bastidigera Went. On *Ambrosia*, M A C, Oakville. 24-48 x 1-2-3.

— **Besseri** Pk. On sub leaves, M A C. Sifton. 24-48 x 4-8.

— (n) **betuleicola** Pk. On birch, Kamora. 24-48 x 4.

Bipod Deem. Injurious to birch seedlings, Dropmore. 24-48 x 2.

- Septoria Brand** Sacc. On cultivated bromie grass; Napuka. Spores $24-64 \times 2 \mu$, mostly 3-septate. Collected and determined by I. L. Connors.
- bromigraea** Sacc. Is commoner than the preceding, forming coalesced spots turning large areas of the leaf brown. Pycnidia seriate, subterminal, $100-85 \times 90-120 \mu$. Spores falcate, acute, granular, $19-31 \times 2.5-3.5$. Type from North Dakota, widespread in Western Canada. (From data by I. L. Connors).
- Callistophi** Glover On cultivated Asters, M.A.C., Brandon. Sometimes injurious. $42-62 \times 2-2.5$.
- **Canadensis** (Leach) Sacc. On cultivated hemp, Morden $25-40 \times 1-1.5$.
- (a) **Caricis** Pass. On *C. ventricosa*, Norway House. $30-40 \times 2$.
- **chrysanthemella** Sacc. On *C. maximum*, Morden. $80-90 \times 2.5-3$.
- **Circi** Nicol. On *C. arvensis*, M.A.C. $50-90 \times 2.5-3$.
- Clematidis** Rob. On *C. ligusticifolia*, Morden. $30-75 \times 2.3$.
- conspicua** E. & M. Widespread on *Sieromeria*. $33-54 \times 1-1.5$.
- **Convolvuli** Desm. On *C. sepium*; M.A.C. $33-50 \times 1.5-2$.
- Coptidis** B. & C. On *Cephus trifolia*, Victoria Beach $13-23 \times 1$.
- **cornicola** Desm. On *C. stolonifera*, Dauphin $32-66 \times 2.5-3$.
- **corymba** Pk. On hazel, widespread. $30-50 \times 2-3$.
- ctenocribatosarum** Sacc. On musk-melon, M.A.C. $20-30 \times 3-4$.
- Diervillae** E. & E. On *D. Diervilla*, Minsk. $35-45 \times 1-1.5$.
- **divaricata** E. & E. Sometimes injurious to Phlox, M.A.C. $10-23 \times 1.5$.
- Eriogonitis** Pk. On Leguon, Brandon, Carberry. $40-60 \times 1.5-2$.
- **flagellifera** E. & E. On garden pea, M.A.C. Spores $75-150 \times 2.5-3 \mu$. Type from Brookings, South Dakota and, according to J. J. Davis, a northern species.
- **Galeopidis** West. On *G. Torahia*, Norway House; V. W. Jackson. $23-44 \times 1.1.5$.
- Septoria Ghies** Desmouss. and Bisby, n. sp. Spots brown, extending from half the leaf on one side of the midrib to the whole leaf. Pycnidia apophyllous, black, conspicuous,

150-225 μ , large stoma up to 30 μ across. Conidia continuous, hyaline, 45-70 \times 2-3 μ , on conidiophores up to 20 \times 1 μ .

On living leaves of *Collomia linearis* at Beeton, Manitoba, July 28, 1928, W. L. Gordon, 4042 (D 6638).

Septoria (n) *Halepki* E & E. On *H. autumnalis*, M.A.C. 35-50 \times 2-2.5.

— *Halianthi* E & K. On sunflowers, Valley River, M.A.C., Morden. 50-85 \times 2-3.5.

— *heterochroa* Deseri. (probably same as *S. malvicola*). On Malva, M.A.C., Morden. 35-45 \times 2-3.

— *increscens* Pk. On *Trientalis*, Victoria Beach, Minsk. 20-34 \times 1-1.5.

— *Lapparum* Sacc. On *Arctium*, M.A.C. 19-27 \times 1-1.5.

— *lepidicola* E & M. On *Lepidium*, Morden, W. L. Gordon.

— *liatridis* Ell & Davis. On *Lacmaria*, Birds Hill. 60-70 \times 2.5-3.

Lyosporici Speg. Often injurious, on tomato, Lydiatt, Winnipeg, Brandon.

— *malvicola* E & M. On hollyhock, M.A.C. 34-55 \times 2-3.

— *menthicola* Sacc & Lett. On *Mentha*, M.A.C., Brandon. 30-40 \times 2.

Mimuli E & K. A variety of this, or a distinct species, was obtained on *Mimulus ringens* at Grand Beach, July 23, 1928. Spots red brown, indefinite, extending over half or all the leaf, pycnidia minute, 40-75 μ , conidia 24-35 \times 1-1.25 μ .

— *mutiva* Pk. Common and widespread on poplars; doubtless a composite species. 45-55 \times 2-4.

— *Naball* B. & C. On *N. albus*, Woodfield. 20-30 \times 1-2.

— *narvisiana* Sacc. On *Scorpus*, Lake Dauphin. 40-50 \times 4.

— *Negundinis* E & E. On *Acer*, Stonewall, M.A.C. 40-50 \times 2.

— *noctiflorae* E & K. (not *S. Melandrii* Pass., for the spores are septate) On *Lycinus*, M.A.C. A somewhat similar species occurs also on *Silene* and *Lycinus*, except that the spores are 20-30 \times 3 μ , whereas the spores of *S. noctiflorae* are recorded as only up to 36 μ in length.

— *notorum* Berk. Common, conspicuous and somewhat injurious on wheat throughout Western Canada. 18-30 \times 3-4.

Oenothrae Wast. On *O. lutea*, Roblin, Gilbert Plains.

- Septoria Pucciniae** West var *herbarum* A. Sacc. On *Puccin.*, M.A.C. Morden, Portage 24-22 x 2-2.
- **Pucciniae** Sacc. On *Hordeum*, widespread 22-22 x 2-2.
- **pentastemonica** E. & E. Spores are indefinite and areas feebly covering the whole leaf. Pyrenia chiefly hypophyllous, 30-100 μ in diameter wall incomplete (might be mistaken for a *Phaeospora*). Conidia hyaline, rufous, often wider at one end, 30-74 2-25-3 μ . On leaves of *Prunella* *arvensis*, Brandon.
- Pentastemonia** E. & E. On *P. arvensis*, Brandon. Spores appear typical, but are sterile.
- Phaeospora** E. & E. On *P. virginiana*, Winnipeg Beach, W. Popp. 20-30 x 1-1.5.
- Pini** West. On garden pine, Brandon. Spores more indefinite than those of *S. Agropyri* 22-40 x 2-3-3.
- **plantaginis** Pass (probably var. *Plantaginis majoris* Sacc.). M.A.C., Oakville. 22-35 x 1-2.
- Polyzoonium** Deurn. On *Potamogeton* and *Hibiscus*, Gilbert Plains, M.A.C. Kenora. 22-45 x 2.
- **populicola** Ph. On *Populus balsamifera*, Lydiatt 65-80 x 2-4.
- polystoma** E. & M. On *Galium*, M.A.C. 45-60 x 2.
- Rhiz** Deurn. (*Myrothecium* stage not found). Common and often injurious.
- **Rhiz** West. Widespread but not found to be injurious.
- Rhizoglyphus** Ph. & Hale. On *R. lacustris*, Valley River 44-56 x 1-3-2.
- **salicina** Ph. On *Salix* sp., Norway House. Not mature.
- **sambucina** Ph. On *S. canadensis* and *S. racemosa*, Morden, Portage la Prairie 40-70 x 2.
- Scutellariae** Thum. On *S. latifolia*, Kenora. 40-70 x 1-5.
- Seselia** Trill. & Deaur. On *rye*, M.A.C. 20-40 x 2.
- **Shepherdiae** (Sacc.) Deurness. On *Lycopodium*, Birds Hill. Spores 25-50 x 2-4 μ . Near *Cylindrosporium* in that the pyrenium wall becomes obsolete.
- Sept** Ph. On *Microstema*, Kellon, M.A.C. Morris.
- **Sept** & Deurn. On leaves of *S. acutifolium*, Oakville, spores 20-40 x 1-2-2 μ . A *Septoria* on the stems with spores attaining 60 μ in length is probably this species.
- solidaginicola** Ph. On (*Hypochaeris* (*Solidago*)). M.A.C. 40-45 x 1.
- **Sonchi-arvensis** Deurn. & Bailey (*Myrologia*, 20 238). Common, M.A.C., Morden. Spores 20-42 μ long, usually 2-3 μ wide at one end, 1-6 μ at the other.

- Septoria sonchifolia** Cke. Occasional, M.A.C. Spores short, about 20μ long.
- **Stachytis** Rob. & Desm. On *S. palustris*, M.A.C. $40-60 \times 1.5-2$.
- **Stalaris** Rob. & Desm. On *S. media*, Minsiki $50-80 \times 1.1-1.5$.
- **Symphoricarpi** E. & E. On *S. occidentalis*, widespread.
- **Thalictri** E. & E. On *Thalicttrum*, Kenora. $50-80 \times 1.1-1.5$.
- **Triticis** Desm. Occasionally found on wheat, M.A.C., etc. $45-55 \times 2-3$.
- **Urticae** Desm. & Rob. On *U. gracilis* and *Urticastrum*, M.A.C. $40-60 \times 1.5-2$.
- **Verticillae** Rob. On *V. longifolia*, Morden. $30-50 \times 1.5-2$.
- **Violae** West. On violet, Killarney, Minsiki, Kenora. $20-40 \times 1.5-2$.
- Sphaerographium niveum** Desm. & House. On *Ribes* stems, M.A.C. Pycnia all white, spores $50-64 \times 2.6-3.8\mu$.
- Sphaerostoma pruinatum** Pk. Common on *Amelanchier* branches, M.A.C. $15-20 \times 7-9$. (Placed by Petrak in *Lagynodicta*).
- Sphaerostoma Helvella** Karst. On *H. infusa* and *Gyromitra*, Victoria Beach, Minsiki. Spores continuous, $9-11 \times 4\mu$.
- Sphaeropsis albaeana** E. & E. On *Acer Negundo*, common and apparently injurious, M.A.C. Spores $15-24 \times 10-12\mu$. Agrees with co-type from North Dakota.
- **Amorphae** E.H. & Barth. On *A. fruticosa*, M.A.C. $18-26 \times 9-11$.
- **celastriana** Pk. On *C. scandens*, M.A.C. $21-30 \times 9-11$.
- **Coryli** E. & E. On hazel branches and twigs, M.A.C. $18-24 \times 10$.
- **fertilis** Pk. On ash twigs, M.A.C. $22-30 \times 10-12$.
- **malorum** Pk. On apple twigs, not common on leaves, *Physalospora* stage not found, M.A.C., Morden. $18-28 \times 9-11$.
- **Manispermis** Pk. On old stems of *M. canadensis*, M.A.C. $20-27 \times 9-11$.
- **olivacea** Oth. (*Melanconospora*). On *Tilia*, M.A.C. $20-30 \times 10-12$.
- **ribicola** C. & E. On twigs of *Ribes*; M.A.C. $19-24 \times 9-11$.
- **Syringae** (Fr.) Pk. & Clint. On *Ilao* twigs, M.A.C. $19-24 \times 10-12$.

- Sphaeropsis ulmicola* E. & E. On elm twigs, M.A.C. 20-27
x 9-11.
- *vitigena* E. & E. On wild grape twigs, M.A.C. 14-28
x 7-11. *S. fabaeformis* Sacc. is probably the same, and
perhaps also *S. vinicola* Pass.
- *zonata* Pass. On twigs of *Lonicera*, M.A.C.; W. L.
Gordon. 22-24 x 10-11.
- Stagonospora albescentis* Davis. On *Carex*, Norway House.
50-65 x 8-10.
- Amorphus* Doorn & Babby *Mycologia*, 20 (236). M.A.C.
42-50 x 4-6.
- *Atriplicis* (West.) Lind. (with many synonyms). On
Elitem and *Chenopodium*, Valley River, Brandon,
Lydiatt, Duck Island, Lake Winnipeg. 10-22 x 4-8.
- *Smilacis* (E. & M.) Sacc. On leaves of *S. herbacea*, M.A.C.
13-22 x 4-7.
- Vermicularia circinans* Berk. On onion, not common,
M.A.C.
- *Dematium* (Pers.) Fr. On old herbs, M.A.C. 17-23 x 4.
- *Dematium* var. *samaricola* Sacc. On ash *samarae*, M.A.C.
16-20 x 4.
- Rhizosporium* West. On *Smilax* leaves, M.A.C.
- *rubroflavescens* Ellis. On rhubarb petioles, Winnipeg
20-25 x 4-5.

FUNGI ON MAN AND HIGHER ANIMALS OBSERVED AT WINNIPEG.

By A. M. DAVIDSON

A large and important group of cutaneous affections are due to fungi and are known as Dermatomycoses. This group includes ringworm, favus, Seborrhoea, Pityriasis, Blastomycosis, and Sporotrichosis.

Ascomycetes

SACCHAROMYCETES (Yeasts)

Saccharomyces cerevisiae Hansen. Causing dermatitis of the hands.

Endomyces albicans Vuillemin. Causing thrush of the mouth.

GYMNOSPORACEAE

Microsporum audouinii Gruby. : Causing ringworm of
Trichophyton megalosporum Sabouraud; the scalp.

<i>Trichophyton acuminatum</i> Bodin	}	Causing ringworm of the body
— <i>violaceum</i> Bodin		
— <i>flavum</i> Fox		
— <i>telium</i> R. Blanchard	}	Causing ringworm of the groin known as Tinea Cruris.
<i>Epidermophyton inguinale</i> Sabouraud		
— <i>Pernstii</i> Castellani		
— <i>rubrum</i> Castellani	}	Causing favus
<i>Achorion gryseum</i> Bodin		
— <i>Schoenleinii</i> Lebert		

ASPERGILLACEAE

<i>Aspergillus malignus</i> Godeolet.	Causing otomycosis	
— sp.	}	Found in the sputum of asthma and tuber- culous patients.
<i>Penicillium</i> sp.		

Hyphomycetes

<i>Cryptococcus dermatitis</i> Gilchrist & Stokes.	Causing blasto- mycosis in man.	
<i>Monilia</i> sp.	Causing paronychia in the finger-nail bed.	
<i>Sporotrichum</i> Schenckii Holsten & Perkins.	Causing sporo- trichosis (ulcers of the skin and inflammation of the joints).	
<i>Oospora Bovis</i> Sauvageau & Radam.	Causing actinomycosis in cattle and man.	
— <i>minutissima</i> Sabouraud	Causing erythrasma in the groin	
<i>Melassezia furfur</i> Ch. Roben.	Causing pityriasis versicolor on the body	
<i>Pityrospora Malassezi</i> Sabouraud.	Known as the spore of Malassez. Causing pityriasis of the scalp and body.	

Dr Cadham has reported cases of asthma in Mani-
toba due to the urediniospores of *Puccinia graminis*
(20)

XV

THE LICHENS OF MANITOBA

By KIRK SCOTT WRIGHT¹

The following is no more than an introduction to the lichen flora of Manitoba as it comprises only 90 species out of a probable 300 or more. No other survey of the lichens of the Province has been made except that of the late John Macoun (19), who recorded 614 species for the whole of Canada, of which 40 were found in Manitoba. Busby and Buller (29), in 1922, brought together Macoun's Manitoban records. These were principally from the Lake Winnipegous district which has never been re-surveyed. The species listed below are those collected by the writer during the four summers of 1925-1928. The localities from which specimens were examined are from the southern, and more especially from the south-eastern, part of Manitoba, except for a few collections brought from Norway House by Dr. Busby. The vicinity of Indian Bay, which is in Manitoba on the Lake of the Woods at the terminus of the Greater Winnipeg Water District Line, has been surveyed more intensively than any other area. Kenora and Minaki have also been visited, and

¹ Mrs. Wright née Kirk Scott, critically studied the lichens of south-eastern Manitoba during her connection with the Department of Botany of the University of Manitoba. The authors are much indebted to her for contributing this Section. (Note by the authors.)

a record marked " Lake of the Woods " is to be understood to include one or both of these localities and also Indian Bay. Many additional species must occur in the northern part of the Province. Difficult species named here were identified, and practically all were verified, by the late Dr. Bruce Fink of Miami University, Oxford, Ohio, and by his assistant Miss Joyce Hedrick, to both of whom the author is greatly indebted for assistance. The nomenclature used is that of Dr. Fink.

Those interested in the lichens may note that the following ten of the species reported from Manitoba by Macoun have not been found during the course of the present studies:

Arthonia patellulata
A. radiata var. *Swartziana*
Biatorella moriformis
Bilimbia sabuletorum
B. sphaeroides
Collema tenax
Gyalacta lutea
Lecanactis prennnea var. *chloroconea*
Nephromium recurvatum
Physcia orbicularis.

These ten species added to eighty in my own List bring the total number of Manitoban lichens up to ninety.

***Arthonia leideola* Nyl.** Common on the bark of trees such as hawthorn and plum, Indian Bay to Carberry.

***Basilia parsonsia* (Ach.) T. Frise.** On bark and dead wood including balsam fr., Lake of the Woods.

***Calicium polyporeum* Nyl.** Parasitic on various polypores, especially *Polyporus parsonsiae*, and sometimes on *Daedalea confragosa*, M.A.C., Norway House.

— ***pusillum* (Ach.) Floerke.** On oak stump and on conifers; M.A.C., Norway House.

- Cladonia glaberrima*** (Flörke) T. Frass. On bark of trees and on dead wood e.g. balsam fir. Victoria Beach.
- microscopus*** Ach. Fork. On bark of tamarack and poplar, M.A.C., Indian Bay.
- Colpoclema sarcosum*** Tuck. On bark of larch and cedars, Indian Bay.
- siligera*** Ach. On trunks and branches of trees, on old wood of tamarack etc. Harde Hall, Lake of the Woods.
- glaberrima*** L. Ach. On grassy ground and stones. Tree bank.
- fragrans*** L. Ach. On trunks and branches of trees and on old logs. Indian Bay to Harde Hall.
- Cladonia alpicola*** L. Kützsch. On earth and rocks among mosses in sandy soil and on old wood. Often associated with other forms of *Cladonia* and with *Microcladonia parvula*. Very common and widely distributed.
- curvata*** Ach. Spring. On earth or wood among mosses. Indian Bay.
- conspicua*** L. Wulfen. On earth and rocks, sandy soil, old wood. Not nearly so common as the next species. Lake of the Woods.
- crispicollis*** Tuck. On old wood and earth, growing on an over bank of a stream, on sandy soil. Very common, usually associated with other species of *Cladonia* and very often with *Polytrichum*. Lake of the Woods.
- deltoidea*** L. Hoffm. On earth and on earth under trees, and on old wood. Indian Bay to Winnipeg.
- fragrans*** Flörke. Spring. On earth and rocks, sandy soil, mostly on old wood always associated with other species of *Cladonia* and very often with *Polytrichum*, Lake of the Woods.
- constrata apiculata*** Ach. Wulfen. On earth, sandy soil, old during winter. Indian Bay to Harde Hall.
- constrata simplex*** Wulfen. Wulfen. On old stumps and logs, on logs and on wet sandy soil. Lake of the Woods.
- binaria parvula*** Wulfen. Fork. On rocks among mosses, on old wood and on earth in sandy soil under trees, usually associated with other *Cladonia*. Lake of the Woods.
- binaria ramosa*** Hoffm. Flörke. Among mosses over rocks, usually associated with other *Cladonia*. Lake of the Woods.
- granata*** L. Wulfen. On earth, sandy soil, old wood. Indian Bay to Winnipeg.
- granata hybrida*** Tuck. On earth, sandy soil, old wood, Lake of the Woods.

- Cladonia pyxidata** (L.) Hoffm. On earth and old wood, Indian Bay to Birds Hill.
- **conglutinata** (L.) Vob. Clustered or almost solitary among other *Cladonia*s, especially *C. alpestris*. On earth over rocks, among moss, or on sandy soil, common in eastern and northern Manitoba.
- **sylvatica** (L.) Hoffm. Occurs solitary or in clusters also associated with other *Cladonia*s, among moss over rocks.
- turgida** Hoffm. On earth and on humus over rocks, Indian Bay.
- **uniclata** (L.) Hoffm. On rocks, associated with other *Cladonia*s, especially *C. furcata racemosa*, and on dry prairie ground, Treesbank and Lake of the Woods.
- verticillata** Hoffm. On earth, humus over rocks, sandy soil, Indian Bay to Carberry.
- Dermatocarpon minutum** (L.) E. Fries. On rocks, Lake of the Woods.
- Evernia thamnodes** (Plot.) Nyl. Common on branches and trunks of trees, especially conifers, always associated with other lichens such as *Parmelia* and *Ulexia*, Lake of the Woods, Treesbank.
- Graphis scripta** (L.) Ach. On old poplar, Lake of the Woods.
- Gyrophora Dilleni** (Tuck.) Arn. On bare exposed rocks, Lake of the Woods.
- **Muhlenbergii** Ach. On rocks, Lake of the Woods.
- Lecanora Hagani** Ach. Occurs commonly on rocks, rarely on wood, Treesbank.
- **muralla** (Schreb.) Tuck. Very closely attached to rocks, Treesbank and Lake of the Woods.
- **muralla saxicola** (Poell.) Tuck. On rocks, Lake of the Woods.
- **rubina** (Lam. & DC.) Ach. On rocks, Lake of the Woods and Saskatchewan.
- **subfusca** (L.) Ach. On old wood and trunks of trees, rarely on rocks, noted on poplar and oak, Lake of the Woods.
- Leclidea anthracophila** Nyl. On burnt or charred wood, Norway House.
- granulosa** (Hoffm.) Ach. On bits of cedar and jack pine, Victoria Beach.
- **parasma** Ach. On bark of trees or old wood, such as oak and poplar, Victoria Beach.
- vernalis** (L.) Ach. Occurs over moss at base of trees, Kenora.

- Lepigium transversoides** (L.) S. F. Gray. On rock, near wet places, streams, lake shores, etc. Indian Bay.
- Paraselia Borreri** Turb. On bark of trees, e.g. ash, leaved rough up to bark on moss, over rocks. Indian Bay.
- capitata** (L.) Ach. Well-spread on trunks and branches of trees in great abundance, rarely on stones and boulders.
- coltrata** Ach. On trees and old wood. Indian Bay.
- compansa** Ehrh. & Ach. Very abundant on rocks, Lake of the Woods.
- **costata** (Sw.) Ny. On trees, especially spruce and tamarack, Lake of the Woods.
- mollicula** Ach. On dry peaty ground, stones, and boulders. Treebank and Yonker in Saskatchewan.
- olivacea** (L.) Ach. On twigs and trunks of trees including yew and hawthorn. Indian Bay to Birds Hill.
- perula** (L.) Ach. On branches and trunks of old logs in a forest, Indian Bay.
- **physodes** (L.) Ach. On trees, Indian Bay.
- **scutella** (L.) Ach. On old logs and trunks and branches of trees, especially cedars. Widely distributed.
- **villosa** Tayl. On trees and fallen logs in forests, Indian Bay, etc.
- **Ulex** Hoffm. Ach. On trees and rocks, Lake of the Woods and Birds Hill.
- Peltigera apthosa** (L.) Willd. Among moss over rocks, on earth under trees, Lake of the Woods, Birds Hill.
- **minima** (L.) Hoffm. Among moss on rocks, on earth beneath trees, in sandy soil. Lake of the Woods and Birds Hill.
- spuria** Ach. Light. Among moss over rocks, on sandy soil and on old rotting wood, Indian Bay.
- Pleurozia caesia** Hoffm. & Ny. On rocks. Indian Bay.
- limbata** Schreb. Turb. On trees and rocks, Indian Bay.
- obscura** Mot. On bare exposed rock, Indian Bay.
- pulverulenta** (Schreb.) Ny. On trees and old wood, Indian Bay, Winnipeg.
- **stellata** (L.) Ny. On branches and trunks of trees, some; new on rock. Very common and widely distributed.
- Psoredium stuartianum** Lightf. & Hepp. On trees and rocks, Lake of the Woods.
- **sericum** Hoffm. & Hepp. On trees and old wood, common on poplar bark, Lake of the Woods, Winnipeg.
- simplex** (L.) Ach. On rocks, Lake of the Woods.
- **viridianum** (Hoffm.) Hepp. On old wood and rocks, Indian Bay.

- Banallina calicaris** (L.) E. Fries. On trees and old wood, rarely on rocks, Lake of the Woods to Treestank.
- **calicaris farinacea** (L.) Nyl. On rocks, rarely on trees, Indian Bay.
- Rhinodina sophodes** (Ach.) Koerb. On rocks, Indian Bay.
- **sophodes confragosa** (Ach.) Tuck. On old wood, Norway House.
- Rhinocarpus petraeus** (Wulf.) Koerb. On rocks, Lake of the Woods.
- Stereocaulon pasetale** (L.) Hoffm. Among moss and on earth over rocks. Usually associated with *Cladonia* and *Peltigera*. Lake of the Woods.
- Teloschistes chrysophthalmus** (L.) T. Fries. On trees or old wood, rare, Lake of the Woods.
- **lychnus** (Ach.) Tuck. On trees, rarely on rocks, common on oak, poplar, hawthorn, plum; very rarely in fruit, Lake of Woods westward.
- **polycarpus** Hoffm. Tuck. On trees and old wood, common and usually associated with *T. lychnus* and *Pápeus stellaris*, Lake of the Woods westward.
- Uroclaria struposa** (L.) Ny. Crusted on rocks, very common, Lake of the Woods.
- Urena barbata** (L.) E. Fries. On trees and old wood, very rarely on rocks, common and widely distributed.
- **plicata** L.) Hoffm. On branches and trunks of trees, especially conifers, Lake of the Woods, Treestank.
- Xylographa parallela** (Ach.) E. Fries. On old dry wood, Norway House.

XVI

INDEX OF HOSTS OR SUBSTRATA OF CRYPTOCOLOUS AND LICHNICOLOUS FUNGI

The Host Index of Parasitic Fungi given in the next Section includes only the leaf parasites of the woody perennials of Manitoba. Some of the fungi found upon twigs, branches, trunks, or roots of trees and shrubs are certainly parasitic, but one must so frequently be uncertain regarding their parasitism that it seems advisable to place all such fungi, along with many saprophytes, in the more general Index of the present Section. An attempt has been made to arrange these fungi in a sort of descending order of parasitism. The letters under which the species are listed have the following meanings:

- A Fungi occurring on partially living twigs, associated with "die back," cankers, or killing of bark tissue. Usually parasitic.
- B Fungi on living trunks, usually involving the living wood. Few species included, and those apparently parasitic.
- C Fungi on dead but not decorticated twigs and branches which are attached to the plant or fallen, sometimes doubtless including parasites which were involved in the death of the branches.
- D Fungi on dead bark of old logs, trunks, or larger branches, occasionally on the dead outer bark of living trees. Evidently saprophytes.

- E Saprophytes on old wood, especially fallen logs, but including old stumps, standing dead trunks chips or fragments of wood and old decorticated branches. Sometimes fungi such as polypores are included here even though the fruit-bodies appear through the dead bark because the mycelium is presumed to have grown in the wood below.
- F Saprophytes of fallen catkins, seed-coats, dead seeds or, rarely, fallen leaves.

The fungi found upon roots of perennials have not been included in the Index which follows, because only a few of them, including the ubiquitous *Armillaria mellea* have been observed.

A fungus may occur upon more than one of the types of substrata, but such a species is included in the Index only once for each host and under the letter of the first of the categories to which it seems to belong.

A few fungi are indexed under names of herbaceous annuals—these are all examples of saprophytes upon overwintered stems.

A complete record is given of the fungi found associated with poplars, which are predominant trees in the vicinity of the Manitoba Agricultural College where most of the records embodied in this Section were made. With other hosts Myxomycetes, polypores, agarics, or other fungi have seldom been included when they appear to have no specificity in their substratum.

The Index which follows, imperfect as it must necessarily be, may not be much aid in taxonomy, but it is of ecologic interest in that it throws light on the disintegration of the higher plants.

Abies balsamea

- C *Calocybe stipitata*
Dasytypha Agassizii
Scleronectria balsamea
Tyromyces pinastri
 E *Fomes Pin. Abietis*
Gionorm staltorum

Acer Negundo

- A *Fusarium pyrocephalum*
Phoma lamosa
Sphaeropsis abietis
 C *Cytospora annulata*
Idiomyces canadensis
Vaccinia pluricarpa
Fomes aculeatus
Lophostoma triseptatum
Sclerostylus compositum
Tachospora clavigera
Tubercula aria vulgaris
 D *Eutypa lucidula*
 E *Distrypa hochlingae*
Fusarium Negundinis
Gymnospora vagans
Lophostoma quadrinucleatum
Pezizotus elongatipes
P. septicus
Polyporus pubescens

Alnus incana

- C *Merulius rufus*
Parmophora aurantiaca
Polyporus betulinus
Valsa ankura
Valsa merodes
 E *Bertia trondemii*

Amelanchier alnifolia

- C *Calonectria Desmazieri*
Diaporthe uncinata
Karstenia lignyota
Massaria Pyri
M. vomitoria
Pleaspora pustulosa
 D *Cryptosphaeria fasciata*
Distryella quercina
Sphaeronecra pruinosa

Amorpha fruticosa

- A *Camarsporium Amorphae*
Sphaeropsis Amorphae
Singonopora Amorphae
 C *Cucurbitaria elongata*
Diaporthe chlorocarpa
Diplocha Amorphae
 D *Distrypa torrida*
Aster spp., old stems
Leptosphaeria dolobum
Montagnella Helopandae
Ophiobolus fulgida
Phiala cyathoides

Berberis vulgaris

- A *Phoma berberidella*
 C *Cucurbitaria Berberidis*

Betula papyrifera

- B *Fomes tomentarius*
 C *Coniothecium aetaleum*
Distrypa nigra
Distryella decorata
Melanconium parvulum
Polyporus betulinus
Stereum vesiforme
Tubercularia vulgaris
 D *Hypoxylon multiflorum*
Hysterium pulchrum
Lachnum bicolor
Nonasclia nucleata
 E *Leucographa francoisii*
Lophosphaeria pulvinacea
Merulius tremelloides
Panus rudis
Pezizaria atrata
Pezizotus petaloides
 F *Sclerotinia Betulae*

Caragana arborea (cult.)

- C *Cucurbitaria elongata*
Tubercularia vulgaris

Castilleja coccinea, old stems

- Ophiobolus acuminatus*

Carex, old stems*Metasphaeria caryana**Celastrus scandens*A *Sphaeropsis celastrina**Valsa ambigua*C *Oreospora purpurea**Distrype Celastris**Fomes scutellatus**Hysterium insidens**Chamaenerion angustifolium**Pestalotia typhuloides**Chenopodium album**Diplodia Elisia**Phoma longistoma**Cirsium arvense**Lachnum nodulosum**Mollisia atrocinerea**Ophiobolus porphyrogeneus**Phiala cyathoides**Cornus stolonifera*A *Diaporthe albocarpa**Phoma Corni-stolonis**Valsa ambigua**V. cornuta**V. coronata*C *Cryptosporiopsis cornuta**Dermatea Rubi**Leptosphaeria borealis**L. rugosa**Phiala vulgaris**Pileospora pustulans*D *Hysteropustelia Froehi*E *Diaporthe cornicola**Leptosphaeria cornuta**Lophostoma inaeptum**Pestalotia clavispora**Corylus* spp.C *Cetonia turgida**Cenangium furfuraceum**Distrype alboprunosa**Distryella verrucosa ferruginea**Corylus* spp.—cont.C *Hypoxyton fusum**Metasphaeria carylina**Rolenia anomala**Sphaeropsis Coryli**Valsa ambigua**V. leucostoma**Calamagrostis* sp. cult.A *Valsa ambigua**V. leucostoma*C *Polyporus adustus**Tubercularia vulgaris**Crotaegus* sp.C *Diaporthe stictocoma**Distrype atigma**Distryella quereana**Distydisethalium**pustulans**Setisporium compactum**Thyridium canadense**Valsa ambigua**V. leucostoma**Fraxinus pennsylvanica*A *Canthareporium Orni**Fusicladium lentiginum**Sphaeropsis fertilis*B *Fomes ignarius*C *Curculiella Bisbyi**Eutypella Vitis**Hysteroglyphus**Fraxini**Osteopa ucrana**Pezizophora incarnata**Valsa fraxinosa*D *Cenangium populineum**Nematosia nucleata*E *Dinemasporium Roburum**Hormotrichum antiquum**Hysteroglyphum**Mon**Mollisia cinerea**Pestalotia atrata**Sporodoneum compactum*F *Vermicularia dematiacea americana**Velutella cinerea*

<i>Meliosaurus annuus</i>		<i>Populus</i> spp.—cont	
<i>Lachnola sporotricha</i>		B	<i>Oenanthe popalensis</i>
<i>Leptosphæria dolobum</i>			<i>Fomes ignarius</i>
<i>Oedosephalum glo-</i>		C	<i>F. panicola</i> (variety)
<i>merulosum</i>			<i>Didymella canadensis</i>
<i>Humulus lupulus</i>			<i>Fusicolla phaeospora</i>
<i>Diplodia Humuli</i>			<i>Lophosoma vestitum</i>
<i>Lonicera canadensis</i>			<i>Ostropa cincta</i>
C	<i>Conospora mansueti-</i>		<i>Stictis corticispora</i>
	<i>ana</i>		<i>Tothospora prunifor-</i>
	<i>Plecospora pustulata</i>		<i>mis</i>
<i>Melilotus, oil stone</i>			<i>Valsa nigra</i>
<i>Ophiobolus porphyro-</i>			<i>V. translucens</i>
<i>gones</i>			<i>Favos canadensis</i>
<i>Pyrenopeziza calva-</i>			<i>Stecium rufum</i>
<i>ecora</i>			<i>Truncatostroma</i>
<i>Monopermium canadense</i>			<i>amaritum</i>
<i>Diplodia sarmentorum</i>		D	<i>Perichæna corticis</i>
<i>Phoma Monopermii</i>			<i>Amphiphæria be-</i>
<i>Sphaeropsis Mon-</i>			<i>sphaera</i>
<i>spemii</i>			<i>Eutypa lata</i>
<i>Phragmites Phragmitis</i>			<i>Hypoconia patella</i>
<i>Graphyllum minut-</i>			<i>Hypoxylon commu-</i>
<i>bicorne</i>			<i>nitens</i>
<i>Lophosoma Arundi-</i>			H Mosses
<i>nis</i>			<i>Lachnia corticis</i>
<i>Hellina straminea</i>			<i>Melanconia occulta</i>
<i>Picea</i> spp.			<i>Rosellinia peritiza</i>
C	<i>Schizoxylon spinicola</i>		<i>Tympanum sporotrich-</i>
E	<i>Polyporus valvatus</i>		<i>spora</i>
F	<i>Citrona rufofusca</i>		<i>Valeria medusa</i>
<i>Pinus Banksiana</i>			<i>Alecrodactylus amorphus</i>
E	<i>Fomes panicola</i>		<i>Calocera cernua</i>
F	<i>Marasmius androsacrus</i>		<i>Corticium arachno-</i>
<i>Populus</i> spp. ¹			<i>ideum</i>
A.	<i>Dichæna Populi</i>		C. polygonum
	<i>Cytospora chrysos-</i>		C. radicans
	<i>sperma</i>		<i>Cyphella maculans</i>
			<i>Richiomella spinulosa</i>
			<i>Exidia viscosa</i>
			<i>Peniophora affinis</i>
			<i>P. crassa</i>

¹ Principally *P. tremuloides*. *P. balsamifera* only has been found to bear *Dichæna Populi*, *Fomes panicola*, and *Phloeospora annua*. Old logs and limbs of the two poplars just mentioned are difficult to distinguish. A very few of the collections may have been made upon *Populus deltoides*, but it is believed that most of the fungi reported here, with the three exceptions just mentioned, may grow upon trunks of *P. tremuloides*.

Populus spp.—cont.

- D *Sticticum fasciatum*
Helicium Berkleyi
H. polyporum
Scopularia Populi
- E *Arcyria setana*
Craterium austrocephalum
Hemitrichia clavata
H. vesparium
Physcia candelata
P. conlectum
P. myrtil
P. nutans
Stemonitis herbacea
Trocha candelata
Amphispheeria albomaculata
Ceratostoma brevirostre
Coryne sarcodes
Eutypa Asheri
Hyperon rufa
Hypoxyton crustaceum
H. rubiginosum
Hysteroglyphum Macrospheeria
Macrospheeria hirsuta
L. hirsuta
L. spermatum
Lophosoma truncatum
Meliola cinerea
Nectria Fomes
Patellaria atrata
Propolis faginea
Tachyspora populina
T. pygmaea
Clitocybe truncatula
Corticium galactinum
Crepidotus calypsis
C. cinabarinus
C. fulveo-tomentosus
C. haerens
C. herbaceum
C. populeus
Dactylospora minor
Erysimum populinum
Hypochnus ferrugineus
H. wabrenus

Populus spp.—cont.

- E *Lentinus sulcatus*
L. vulpinus
Moraea lacrymans
Mucoria lignicola
Phlebia strigatocornata
Phlebia confragosa
Polyporus adustus
P. arcularius
P. cinabarinus
P. glomeratus
P. hirsutus
P. subchartaceus
P. velutinus
Poria attenuata
P. purpurea
P. vulgaris
Schizophyllum commune
Sticticum fasciatum
S. purpureum
Trametes hirsuta
Botrytis cinerea
Dinemasporium Robinsonii
Helioglyphus gracilis
Trichoderma lignorum
- F *Flukea armeni*
Dicoma arctocoma
- Prunus* *Brachy* (cult.)
- C *Micropera drupacearum*
Valscilla Lachni
- Prunus nigra* (cult.)
- A *Chesteria purpurea*
C *Diaperthe stictostoma*
Fomes pomaceus
Micropera drupacearum
Valsa aculeata
- E *Polyporus tulipiferus*
P. versicolor
- Prunus* (*Pedus*) *nana*
- A *Phoma Pruni*
Valsa cinerea
- C *Diutrype albopruinosa*
D. stigma
Distryphia verrucosiformis

Prunus (Padus) hancei—cont.

- C *Diplodia malorum*
Massaria compuncta
Melanconium ceriseum
Schizoxylon asigne
Sphaeropsis Mali
Thyridium antiquum
- D *Eximia glandulosa*
Solenia tremulae
- E *Conangium populaceum* *prunicolus*
Rosellinia agnaria

Pteris nodulosa—old fronds

- Cyphelia capula*
Dasycephala caroliniana
Lamprodarma scutellariae
Leptostroma litigiosum

Pyrus berylla (cult.)

- A *Sphaeropsis malorum*
- C *Distrype stigma*
Distrypaella irregularis
Eutypa badibranda
Hypoxyton Monm.
Metasphaeria leostoga
Tuberularia vulgaris
Valsa ambigua
- E *Polyporus varicolor*
Sclerophyllum comense

Quercus macrocarpa

- C *Coryneum Kunzei*
C. pustulatum
Dasycephala cerisea
Disporthe talicola
Distrype stigma
Idymosphaeria diplospora
Pezizella amorpha
P. princeps
Helicanthosporium macrocarpon
Osteops enerea
Tenhoepora obducens
Valsa ambigua
- D *Amphisphaeria applonata*

Quercus macrocarpa—cont.

- D *Hymenochaete Carlinii*
Valeria mistiva
- E *Helicanthosporium fusiforme*
Hystero-graphium Monm.
Metasphaeria quercus
Penus styliatus
Patellia sanguinea
Polyporus brunnus
P. rufescens
Propolis sagana
Rosellinia lignaria
- F *Pinnaea fructigena*
Scleroloma parvolutum
terreum

Ribes spp.

- A *Cronospora purpurea*
Dactylia ribesii
Sphaeropsis ribicola
- C *Metasphaeria leostoga*
Sphaerographium ulveum
Thyridium antiquum
Thyromyces cerulinus

Rosa spp.

- C *Disporthe tristicha*
Dudymosphaeria diplospora
Metasphaeria leostoga
Tapelia Roseae
Valsa ambigua

Salix spp.

- A *Cytospora Salicis*
Fusicoccum pyrochlorum
Valsa borealis
V. paucis
V. translucens
- B *Fomes ignarius*
- C *Chromocrota gelatinosa*
Corticium rosaceum
Cytidia aspera
Distrype albopetrinosa salicina
D. stigma
Diplodia Salicis
Favellus canadensis

Salix spp.—cont.

- C *Helotium adhaesum*
Hysteropatella elliptica
Macrophoma Salicis
Ocellularia ocellata
Ostropa cuneata
Pleaspora herbarum
Solenia anomala
Stereum rufum
Teichospora magna
 atropa
Truncatostroma
 americana
Valsa ambigua
V. salicina
- D *Didymella canadensis*
Endia glandulosa
Pemophora cinerea
Stereum vesiculiforme
- E *Dactylia contragosa*
Eutypa lata
Hypoxylon Marasmi
Hysterographum
 Mori
Leptostroma cuneata
Leptostroma con-
 tinua
Lophostoma arcuatum
L. saxatilis
L. triseptatum
Molonia cinerea
Pestalotia atrata
Pestalotia virido-
 flavescens
Polyporus dichrous
Trogia crispata

Solidago,

- old stems
Ophiochloa fulgidus
Rhizospora Solidaginis
R. subgrisea

Sonchus oleraceus

- Leptostroma deli-*
 cium
L. subconica

Symphoricarpos occidentalis

- C *Cryptospora kanadensis*
Leptostroma cili-
Pestalotia perisporae
P. longistria

Symphoricarpos occidentalis—cont.

- C. *Rhizospora Sympho-*
ricarpi
Rosellinia perisporae
D *Hymenochaete cinea-*
toidea

Syringa vulgaris

- A *Sphaeropsis Syringae*

Tilia americana

- C *Cyphella Tiliae*
Exosporium Tiliae
Fusicladium princeps
Massarella Curryi
Sphaeropsis olivacea
Nematoloma nucleata
E *Hypoxylon lascaput-*
pureum
Polyporus tulipiferus
Schizophyllum com-
mune

Trifolium sativum

- Chaetomium elatum*
Cladosporium herba-
rum
Leptostroma culmi-
cola
Sporobolomyces albus
S. roseus

Ulmus americana

- A *Sphaeropsis ulmicola*
C *Cantharellus eruct-*
atus
Diplodia maltoni
Hysteropatella Prostrata
Nummularia repanda
Polyporus conchatus
Thyridia ambigua
Valsa ambigua
D *Monocetia sp.*
Pemophora cinerea
E *Dactylia bochebaga*
Lophostoma trisept-
atum
Polyporus pumilus
P. tulipiferus
Teichospora obtusa

Urtica dioica

- Pyrenopeziza compress-*
sa

Viburnum Lentago

- C *Cryptosporella Lentaginis*
Dothidea Viburni
Didymosphaeria epidermidis
Eutypa radialis
Fomes conchatus
Hysteroglyphum Fraxini
Sclerotia fusca
S. radialis

Viburnum Opulus

- A *Rhizdotheca Viburni-opuli*
 C *Conangium infusum*
Dothidea viburnicola
Dialypella discoides
Didymella maritima
Didymosphaeria epidermidis
Heteropeltella Viburni

Viburnum Opulus—cont.

- C *Hysteroglyphum Fraxinis*
Leptosphaeria borealis
Masaria plumigera tetragora
Peridermium bicolor
Sphaeropsis majorum
Sclerotia fusca
S. mollis

Vitis vulpina

- C *Botryosphaeria fuliginosa*
Coniothyrium olivaceum
Lophotoma trapeziforme
Sphaeropsis vitigena
 E *Melanconium subfasciculata*

Zea Mays, old stalks

- Diplodia Zeae*
Gibberella Saubinetii

XVII

HOST INDEX OF PARASITIC FUNGI

The List of Fungi given in Section XIV contains references to the host plants, indicated in most cases by the generic name alone or in some cases by the common name. The Host Index given in this Section serves as a record of all the species of plants upon which parasitic fungi have been found in Manitoba. The names of the cultivated hosts, as a rule, are those given in Bailey's *Manual of Cultivated Plants*. Most of the names of the native hosts have been taken from Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions* but, owing to the limitations of this Flora in respect to Manitoba, other names of native plants, of necessity, have been taken from Rydberg's *Flora of the Rocky Mountains and Adjacent Plains*.

Part I Parasites of Cultivated Plants.

Hosts marked "(N)" are also native as well as cultivated. For fungi attacking twigs or branches of woody plants, see Section XVI.

Acer Glabrum Maxim.

Rhytisma acerinum

Acer Negundo L. (N.)

Phyllosticta Negundina

Puccinia Negundina

Septoria Negundina

Acer monroviense L.

Rhytisma acerinum

Agropyron cristatum Gaertn.

Claviceps purpurea

Puccinia graminis

Agropyron laterum Vasey (N.)

Claviceps purpurea

Puccinia Clematidis

P. graminis

P. monticola

Agropyron tenerum Vasey (N) —
cont.

Septoria Agropyri
Ustilago bromivora

Agrostis alba L. (N)
Puccinia graminis
Puccinia graminis

Allium Cepa L.
Botrytis Allii
Macrosporium commune
Uromyces Cepulae
Vermicularia circumans

Alpestrum pratense L.
Puccinia graminis

Aldous rosea Cav.
Ascochyta parasitica
Cercospora albicola
Phyllosticta albicincta
Puccinia quercusorum
Septoria malvella

Anthriscum majus L.
Phyllosticta Anthrisci
Puccinia Anthrisci

Apium graveolens L.
Bacillus caratococcus
Septoria Apii

Aquilegia canadensis L. (N)
Martensia Aquilegiae

Asparagus officinalis L.
Botrytis asparagi
Puccinia Asparagi

Aster Chapmani Torr. & Gray
Septoria asteris-purpureae

Avena sativa L.
Bacterium stramoniae
Helmintosporium Avenae
Helminthosporium Avenae
Leptosphaeria avenaria
Pseudomonas coronata
Puccinia coronata
P. graminis
Ustilago Avenae
U. levis

Berberis vulgaris L.
Phyllosticta Berberidis
Puccinia graminis

Beta vulgaris L.
Cercospora betulae
Phyllosticta Betae
Phoma Betae

Brassica oleracea var. *botrytis* L.
Bacillus oleraceus
Phoma lingam

Brassica stramonium var. *capitata* L.
Bacillus oleraceus
Botrytis cinerea
Pseudomonas campestris
Sclerotinia sclerotiorum

Brassica Rapa L.
Alternaria Brassicae

Briza media L.
Puccinia graminis

Breuna terna L.
Claviceps purpurea
Puccinia Claviceps
Septoria Breuna
S. breunigena

Calistephus chinensis Rees
Colosporium in Solidagine
Fusicladium conglutinans Calistephus
Septoria Calistephus

Cannabis sativa L.
Septoria Cannabis

Chrysanthemum maximum Rees
Septoria chrysanthemella

Chrysanthemum morifolium Rees
Oidium Chrysanthemi

Clematis ligusticifolia Nutt. (N)
Cercospora squaridula
Cy. ulmiper var. *Clematidis*
Septoria Clematidis

Cucumis Melo L.
Macrosporium cucumerinum
Septoria cucurbitacearum

Cucumis sativus L.
Bacillus tracheosporus
Cladosporium cucumerinum
Pseudomonas lachrymans
Sclerotinia sclerotiorum

Daucus glomerata L.
Claviceps purpurea
Puccinia graminis

- Ecklonia punctata* Cav
Sclerotinia sclerotiorum
- Daucus Carota* subsp. DC.
Sclerotinia sclerotiorum
- Delphinium elatum* Voss.
Botrytis Delphini
Erysiphe Polygoni
Rhizoctonia Solani
Sclerotium Delphini
- Dianthus Caryophyllus* L.
Uromyces caryophyllinus
- Prunus americana* Duch.
Botrytis cinerea
Rhopalia Tulamiae
Rhizopus nigricans
- Fraxinus pennsylvanica* Marsh.
(N.)
Phyllosticta viridis
Piggetia Fraxin.
Puccinia fraxinata
Septoria Dooseyi
- Gallardia aristata* Persh.
Entyloma pycnosporum
- Gladus* spp.
Bacterium marginatum
- Gadus grandiflora* Lindl.
Pucciniastrum Epilobii
- Helianthus annuus* L.
Botrytis vulgaris
Erysiphe Helianthorum
Plasmopara Halstedii
Puccinia Helianthi mollis
Sclerotinia sclerotiorum
Septoria Helianthi
- Hibiscus scaberrimus* L.
Phyllosticta sp.
- Holcus Sorghum* L.
Sphaecothea Sorghi
- Holcus Sorghum sudanensis*
Hibb.
Basillus Sorghi
Puccinia graminis
- Hordeum vulgare* L.
Claviceps purpurea
Erysiphe graminis
Helminthosporium graminis
seu
- Hordeum vulgare* L.—cont.
Helminthosporium sativum
H. teres
Heliosporium Avenae
Pseudomonas translucens
Puccinia anomala
P. graminis
Septoria Passerina
Uromyces Hordei
U. nuda
- Iberis amara* L.
Rhizoctonia Solani
- Iris* spp.
Basillus carotovorus
Heliosporium graminis
- Juglans nigra* L.
Microstroma Juglandis
- Lactuca scariola* L.
Botrytis cinerea
Puccinia horrenata
Sclerotinia sclerotiorum
- Leporus oculatus* L.
Puccinia graminis
- Lathyrus odoratus* L.
Microsphaera diffusa
Rhizoctonia Solani
- Lepidium sativum* L.
Peronospora parasitica
- Lilium dauricum* Kar.
Botrytis parasitica
- Linum catharticum* L.
Fusarium Lem.
Melampsora Lini
- Lonicera maritima* L.
Glomerularia Corei
Microsphaera Alni Lonicerae
- Lychnis chalcedonica* L.
Phyllosticta Lychnidis
Septoria aestiviflora
- Lychnis Flammula* Lam.
Septoria aestiviflora
- Lycopersicon esculentum* L.
Alternaria Solani
Bacterium michiganense
Cladosporium fulvum

- Lycopodium aculeatum* L.
cont.
Fusarium *Lycopodium*
Phoma *destructiva*
Rhizoctonia *Solan*
Septoria *Lycopodium*
- Medicago sativa* L.
Ascochyta *Medicago*
Peronospora *trichorum*
Puccinia *Medicago*
Pseudopeziza *Medicago*
Pyrenopeziza *Medicago*
Sclerotium *trichorum*
- Melilotus alba* Desr.
Ascochyta *Melilot*
Cercospora *Davies*
- Melilotus officinalis* Lam.
Ascochyta *Melilot*
- Monarda mollis* (Nutt.)
Puccinia *Monarda*
- Nicotiana* (ornamental sp.)
Alternaria *Solan*
- Passiflora alata* Pall.
Botrytis *Passiflora*
Phyllosticta *Commerson*
Septoria *Passiflora* *berolensis*
- Passiflora milacorum* L.
Sporosporium *Passiflora* *milacorum*
- Pastinaca sativa* L.
Botrytis *oxera*
Cercospora *Pastinaca*
Cylindrosporus *crassus*
Ramularia *Pastinaca*
Sclerotium *Sclerotium*
- Polemonium hortense* Bailey
Batilum *caulivorus*
Botrytis *cinerea*
- Phalaris canadensis* L.
Puccinia *graminis*
- Phaseolus vulgaris* L.
Colletotrichum *Linde-*
muthianum
Pseudomonas *Phaseoli*
- Phlox pratensis* L.
Claviceps *purpurea*
Erysiphe *graminis*
- Phlox pratensis* L.—cont.
Botrytis *Phlox*
Puccinia *graminis*
Sclerotium *graminis*
- Phlox Drummondii* Hook.
Septoria *divaricata*
- Picea abies* Karst.
Peridermium *coloradense*
- Picea canadensis* L.
Ascochyta *Picea*
Caulotrichum *Picea*
Erysiphe *Picea*
Fusarium *Martinii* *Picea*
Pseudomonas *Picea*
Septoria *Sagittifera*
S. *Picea*
Uromyces *Picea*
- Poa pratensis* L.
Claviceps *purpurea*
Colletotrichum *crassus*
Erysiphe *graminis*
Puccinia *Poa*
Sporotrichum *Poa*
- Populus* spp.
Melampsora *Medusa*
- Potentilla fruticosa* L.
Phragmidium *Andersonii*
- Prunus nigra* Art.
Cladosporium *carpophilum*
Cylindrosporus *prunophorus*
Erysiphe *Prunus*
Sclerotium *cinerea*
- Prunus* spp.
Erysiphe *Prunus*
Phyllosticta *cinerea*
Podosphaera *Oxyanthus*
- Pyrus baccata* L.
Botrytis *amylovorus*
Caulothyrus *pyrinum*
Fusicladium *expansum*
Phyllosticta *pyrus*
Sphaeropsis *malorum*
Venturia *pyrus*
- Raphanus sativus* L.
Albugo *caudata*
Pythium *de Baryanum*

- Rhamnus cathartica* L.
Puccinia coronata
- Rhus glabra* L.
Ascochyta *Rhus*
Colletotrichum coccum
Phoma herbarum
Phyllosticta straminea
Vermicularia subfuliginea
- Ribes Grossularia* L.
Puccinia Grossulariae
Septoria Ribis
- Ribes nigrum* L.
Puccinia Grossulariae
Septoria Ribis
Sphaerotheca mors-uvae
- Ribes odoratum* Wendl.
Gloeosporium Ribis
Septoria aurea
- Ribes sativum* Syme.
Septoria Ribis
- Rorippa Armoracia* Hitch.
Ramularia Armoraciae
- Rosa* spp.
Actinonema Rosa
Eckia speciosa
Phragmidium disciflorum
Pseudomonas tumefaciens
Sphaerotheca Humuli
S. pannosa
- Rubus idaeus* L. var. *strigosus*
 Maxim.
Asterina rubicola
Oosporium Fockii
Gloeosporium venetum
Mycosphaerella rubra
Septoria Rubi
Sphaerostema Humuli fuliginea
- Salsola* spp.
Gloeosporium Salsolae
Melampsora Bigelovii
Rhizina saccharum
Uromyces Salsolae
- Sambucus canadensis* L. (N.)
Septoria sambucina
- Sambucus racemosa* L.
Septoria sambucina
- Secale cereale* L.
Claviceps purpurea
Erysiphe graminis
Pseudomonas translucens
Secalis
Puccinia dispersa
P. graminis
Septoria Secalis
Uromyces occulta
- Sesuvium portulacastrum* L.
Puccinia sp.
Pseudomonas glycinea
- Solanum Melongena* L.
Alternaria Solani
- Solanum tuberosum* L.
Actinomyces scabies
Alternaria Solani
Bactera atrocephala
Colletotrichum atrocephalum
Fusarium
F. decolor sulphureum
F. oxysporum
Phytophthora infestans
Rhizoctonia Solani
Spondyliotidium atro-
varia
Stylocheilus stemonitis
Vectotilium albo-atrum
- Spinacia oleracea* L.
Pecanosporea effusa
- Statice latifolia* Sm.
Alternaria Solani
- Striga vulgaris* L.
Microsphaera Ala.
- Tanacetum vulgare* L.
Ramularia Tanacetii
- Triticum americanum* L. (N.)
Phyllosticta Triticis
- Triticum hybridum* L.
Coronopsis sativae
Polythraxium Triticum
Uromyces hybridus
- Triticum medium* L.
Uromyces Triticum

- Trifolium pratense* L.
Erysiphe Polygoni
Gloeosporium apothecium
Pseudopeziza Trifolii
Scyrtotinia sclerotiorum
Uromyces fluitans
U. Trifolii
- Trifolium repens* L.
Cercospora subtrina
Polythrincium Trifolii
Uromyces Trifolii-repentis
- Trifolium arvense* L.
Cladosporium graminum
Claviceps purpurea
Erysiphe graminis
Fusicladium culinarum
P. graminis-arven
Helminthosporium sativum
Ophiobolus graminis
Pseudomonas atrofaciens
P. translucens undulosa
Puccinia graminis
P. tritici
Septoria nodorum
S. Tritici
Tilletia horvii
T. Tritici
Ustilago Tritici
- Triticum durum* Schrank
Puccinia graminis
- Triticum monspeliense* L.
Puccinia graminis
- Triticum spelta* L.
Puccinia graminis
- Triticum polanicum* L.
Puccinia graminis
- Vitis americana* L. (N)
Gnomonia ulmæ
- Veronica longifolia* L.
Scyrtotinia Veronicæ
- Viola villosa* Roth
Ascochyta Pisi
- Viola tricolor* var. *hortensis* DC.
Cercospora Viola-tricoloris
Puccinia Violæ
Sphaerotheca Humuli-aphidis
- Viola riparia* Michx.
Plasmopara viticola
- Zea Mays* L.
Becklesia Sorgho
Heterosporium gracile
Nigrospora sphæræa
Puccinia Sorgho
Ustilago Zeæ

Part II Parasites of Plants growing without Cultivation.

If the host is cultivated in part or if it is an escape, see Part I. For fungi attacking twigs or branches of woody plants, see Section XVI

- Aster helianthus* (L.) Mill.
Helminthosporium elatæ
Uromyces nitabellæ
- Aster epiciatus* Lam.
Gloeosporium tremellinum
Phloeospora canadensis
Phyllosticta rumicis
P. maculosa
Rhizina punctatum
Uncinula cinctata
- Achillea millefolium* L.
Encyrtina Achilleæ
Puccinia millefolii
- Actæa alba* (L.) Mill.
Puccinia Clematidis
- Actæa eluræ* Rydb.
Ramularia Actææ
- Actæa rubra* (Ait.) Willd.
Puccinia Clematidis
Ramularia Actææ

- Apodaca anthodora* Nutt.)
Britt
Sphaerotheca Humuli
Agrostis pycnantha Wallr.
Pucciniaceum Agrostaceae
Agropyron caninum (L.) R. & S.
Claviceps purpurea
Puccinia graminis
Agropyron repens (L.) Beauv.
Claviceps purpurea
Erysiphe graminis
Phyllachora graminis
Puccinia graminis
Agropyron Richardsonii Schrad.
Claviceps purpurea
Puccin & Clematidis
P. graminis
P. montanensis
Septoria Agropyri
Agropyron Smithii Rydb.
Aecorhyta graminicola
Claviceps purpurea
Puccinia graminis
P. montanensis
Agrostis agymala (Walt.) B.S.P.
Puccinia graminis
P. latridis
Aletris rubicordium Raf.
Cladophytium Aleuticum
Doassanza Aleutica
Rhytisma Aleuticum
Aletris racemosa (L.) Moench
Microspora Aletris
Plasmoglyphus Aletris
Septoria Aleutica
Alopecurus cristatus Michx.
Uromyces Alopecuri
Alopecurus pratensis L.
Puccinia graminis
Amaranthus retrofractus L.
Albugo Rti
Microsporium Amaranthi
Andrena pulchellipes DC.
Plasmopara Halstedi
Andrena trifida L.
Etioloma Compositarum
Erysiphe Cichoracearum
Puccinia Xanthi
Septoria hirsutigena
Andrachne alajolia Nutt.
Aposporia Collaris
Gymnosporangium clavari-
forme
G. corniculata
G. junceaefera
Hendersonia Mali
Phyllosticta innumerabilis
Podosporella Oxycanthae
Trichosporium parviticum
Amorpha canescens Pursh
Corospora psammosoides
Uromyces Amorphae
Amorpha nana Nutt.
Uromyces Amorphae
Amorpha fruticosa L.
Uromyces Amorphae
Amphicarpa See Falcata
Andromeda polifolia L.
Rhytisma Andromedae
Andropogon furcatus Muhl.
Puccinia Eleusine
Sphaerodotheca occidentalis
Andropogon procerus Lam.
Puccinia Eleusine
Anemone canadensis L.
Didymaria didyma
Puccinia Clematidis
Septoria Anemones
Anemone cylindrica A. Gray
Phyllosticta Anemones
Anemone hepatica L.
Puccinia Clematidis
Apocynum androsaemifolium L.
Cercospora Apocyni
Apocynum cannabinum L.
Cylindrosporium Apocyni
Apocynum cd racem Jacq.
Cercospora Apocyni
Cylindrosporium aburcum
Septoglyphum Apocyni
Arabis sp.
Puccinia ranuncul.
Arabis canadensis L.
Cercospora leptoglossa
Nymphaea clavellata

- Arctium Lappa* L.
Phyllosticta Lappae
Septoria lapparum
- Arctium minus* Sord.
Puccinia Bardanae
- Arctostaphylos Uva-ursi* (L.)
Spreng.
Exobasidium Vaccinae
- Argemone anemone* (L.) Byth.
Ranularia arvensis
- Artemisia grapholodes* Nutt.
Cyathosporium Artemisiae
Puccinia Abundans
P. universalis
- Aster ageratoides* L.
Colletotrichum tumescens
Phyllosticta cornuti
- Aster cordifolius* L.
Coleosporium Solidaginis
Puccinia Asteris
- Aster ferox* L.
Coleosporium Solidaginis
- Aster Lindleyanus* T. & G.
Coleosporium Solidaginis
Erysiphe Cichoracearum
Puccinia Asterum
Septoria atropurpurea
- Aster multiflorus* Ait.
Puccinia Asteris
- Aster neogriffithii* L.
Puccinia Asteris
- Aster paniculatus* Lam.
Coleosporium Solidaginis
- Aster plumbicoides* T. & G.
Coleosporium Solidaginis
- Aster salicifolius* Lam.
Coleosporium Solidaginis
- Aster* sp.
Cercospora cana
Entyloma compositarum
- Astragalus T alpinus* L.
Phyodendrona megastoma
- Astragalus carolinianus* L.
Peronospora Trifoliorum
- Asteris folius* L.
Puccinia coronata
P. graminis
- Baccharis cruciformis* (L.)
Rost.
Colletotrichum graminicola
Erysiphe graminis
Puccinia graminis
P. coronata
Ustilago straminea
- Betula papyrifera* Marsh.
Gloeosporium Betulae-
papyriferae
Melanconium Betulae
Phyllosticta Coryli
Phyllosticta Betulae
Septoria betulicola
S. Baycei
- Bidens cernua* L.
Septocylindrium conocephalae
- Bidens frondosa* L.
Cercospora umbellata
Plasmopara Halimidis
Septocylindrium conocephalae
Sphaerotheca Humuli fuliginosa
- Bidens vulgata* Greene
Septocylindrium conocephalae
- Bidens villosa* (L.)
Dum.
Puccinia Polygoni-amphibii
Septoria Polygonorum
- Bium sagittatum* L.
Diagonospora Atriplicis
- Bouvardia carpendula* (Michx.)
Torre
Puccinia vocata
- Brauneria juncea* (L.) Camen
Peronospora parasitica
- Bromus ciliatus* L.
Roestelia tenuispora
Puccinia coronata

- Bromus latifolius* (Shear)
Hitch.
Roztopia tenuipora
- Bromus pappus* L.
Roztopia tenuipora
- Bursa Bursa-pastoris* (L.) Brits.
Albugo candida
Peronospora parasitica
- Calamagrostis canadensis* (Michx.)
Beauv.
Claviceps purpurea
Puccinia coronata
- Calamagrostis elongata* (Kear.)
Rydb.
Puccinia coronata
- Calamagrostis longifolia* (Hook.)
Hack.
Puccinia anophigens
- Calla palustris* L.
Cercospora Callae
- Calla palustris* L.
Erysiphe Polypodii
Puccinia calthaeicola
- Cephaelis sempervirens* (L.)
Berk.
Peronospora Corydalis
- Ceras opulifolia* Wahl.
Clitroctia Cerasi
- Ceras Douglasii* Boott.
Puccinia universalis
- Ceras dioeciale* Bailey
Puccinia strumens
- Ceras prostratum* Boott.
Puccinia universalis
- Ceras Serotini* Dewey
Puccinia Peckii
- Ceras scoparia* Schk.
Puccinia Asterum
- Ceras varia* Muhl.
Clitroctia Cerasi
- Ceras viscaria* L.
Phyllactinia Cerasi
Puccinia urticae
Septoria Cerasi
Stagonospora albescens
- Ceras* spp.
Puccinia Granulariae
P. hirsuta
- Castilleja coccinea* (L.) Sprang.
Ramularia coccinea
- Celastrus scandens* L.
Phyllactinia Cocylea
Phyllactinia sparmoides
Ramularia Celastris
- Cerastium vulpium* L.
Melampsorella crotaria
- Chaetochloa glauca* (L.) Scribn.
Ustilago neglecta
- Chaetochloa stridis* (L.) Scribn.
Piricularia grisea
Sporospora graminacea
- Chamaedaphne calyculata* (L.)
Moench.
Gloeosporium Chamaedaphniae
Venturia pulchella
- Chamaenerion spicatum* (Lam.)
S. F. Gray
Monochaetia Kriegeriana
Puccinia gigantea
Pucciniastrum Abietis-Chamaenerii
Ramularia excoepocordes
R. prostriformis
- Chamaeperichytrium*. See *Cortium*.
- Chamaecyparidophila* (Pers.)
Smal.
Uromyces praemorsus
- Chierimia chierandroides* (L.)
Link.
Peronospora parasitica
- Chenopodium album* L.
Cercospora dubia
Peronospora effusa
Stagonospora Atriplicis
- Chimaphila umbellata* (L.)
Nutt.
Myosphaerella Chimaphilae
- Cicuta maculata* L.
Puccinia Ciculae

- Cirsium alpinum* L.
Puccinia *Cirsosae*
- Cirsium crenatum* (L.) Scop.
Albugo *Tragopogonis*
Pyrenopeziza *crysanthoides*
Sclerotinia *colicliarum*
Septoria *Cirsii*
- Cirsium Flodmanii* (Rydb.)
Arth.
Puccinia *Cirsii*
Uromyces *Funci*
- Cirsium vulgatum* (Walt.)
Sporang.
Puccinia *Cirsii*
- Collomia linearis* Nutt.
Phytophthora *parviflora*
Septoria *Giliae*
- Comandra lucida* Richards
Cronartium *Comandrae*
Puccinia *Comandrae*
- Comandra pallida* DC.
Cercospora *Comandrae*
Cronartium *Comandrae*
Puccinia *Andropogonis*
- Comarostaphylis palustris* L.
Sapoglyphium *Fragariae*
- Convolvulus sepium* L.
Ramularia *sepium*
Puccinia *Convolvuli*
Septoria *Convolvuli*
- Coptis trifolia* (L.) Salisb.
Septoria *Copulidis*
- Cornus canadensis* L.
Glomerularia *Corni*
Phyllosticta *Corni canadensis*
Puccinia *porphyroganite*
- Cornus stolonifera* Michx.
Phyllosticta *Coryli*
Septoria *cornicola*
- Corylus americana* Walt.
Gnomonella *Coryli*
G. *Coryli* var. *climata*
Phyllactinia *coryli*
Septoria *corylina*
- Corylus rostrata* Ait.
Glomerularium *Coryli*
Gnomonella *Coryli*
Microsphaera *Alni*
- Crataegus coccinea* Auct.
Gymnosporangium *germinale*
Phyllosticta *Crataegi*
- Dasystephana Andreeana* (Griseb.)
Small
Asteroma *Gentianae*
- Diervilla Diervilla* (L.) MacM.
Ramularia *umbellata*
Septoria *Diervillae*
- Deschampsia stricta* (Torr.) Rydb.
Puccinia *schubertiana*
- Desmodium umbellata* (Mill.)
Nutt.
Cylindrosporium *Sorbagium*
- Dracopis parviflora* Nutt.
Phyllosticta *Dracopidis*
- Elaeagnus argentea* Pursh.
Cercospora *minutissima*
Puccinia *Cornus-Shepherdiae*
P. *coronata*
- Eleocharis* sp.
Puccinia *Eleocharidis*
- Elymus canadensis* L.
Claviceps *purpurea*
Phyllachora *graminis*
Puccinia *Clematidis*
P. *graminis*
P. *impatiens*
P. *montanensis*
- Elymus curvatus* Piper
Puccinia *Clematidis*
P. *graminis*
P. *montanensis*
- Elymus tinctorius* Beal.
Claviceps *purpurea*
- Elymus junceus* (Rae.) Rydb.
Puccinia *Clematidis*
P. *montanensis*
- Elymus Nuttallii* Vasey
Claviceps *purpurea*
Puccinia *Clematidis*
P. *graminis*

- Styrax virginicus* L.
Phyllosticta graminis
- Epilobium adenocaulon* Harms.
Pucciniastrum Epilobi
Ramularia punctiformis
- Epilobium sylvaticum* L.
Gloeosporium Equiseti
- Eupatorium purpureum* L.
Puccinia Eleocharidis
- Falcata cernua* (L.) Kuntze
Erysiphe Polygoni
Synchytrium decipiens
- Festuca elatior* L.
Puccinia graminis
- Fraxinus americana* (Porter)
 Britt. ex
Fraxinus canadensis Michx.
Macronema Potentillae
Ramularia Tulamiae
Sphaerotheca Humuli
Uncinula parvula
- Galeopsis Tatarici* L.
Septoria Galeopendia
- Galium boreale* L.
Puccinia rubefacens
Septoria polystegae
- Galium trifidum* L.
Puccinia punctata
- Galium triflorum* Michx.
Erysiphe Ochroacearum
Pseudopeziza repanda
Puccinia rubefacens
P. scopulodytes
- Gaultheria procumbens* L.
Venturia Gaultheriae
- Geranium acuta* Michx.
Puccinia Helianthi
- Gerum strictum* Scind.
Corcospora Geri
Sphaerotheca Humuli
- Glycerhiza lepidota* Nutt.
Erysiphe Polygoni
Uromyces Glycerhizae
- Grindelia squarrosa* (Pursh)
 Donal.
Puccinia Asterum
- Grossularia cynosbati* (L.) Mill.
Puccinia Grossulariae
- Grossularia Airtella* (Michx.)
 Spach.
Plasmopara ribicola
- Hedysarum boreale* Nutt.
Uromyces Hedysari
obscure
- Helenium autumnale* L.
Septoria Helenium
- Helianthus divaricatus* L.
Erysiphe Cichoracearum
- Helianthus Maximiliani* Schrad.
Plasmopara Halstedii
Puccinia Helianthi
- Helianthus scaberrimus* Nutt.
Plasmopara Halstedii
Septoria Helianthi
Uromyces Junci
- Hieracium tuberosum* L.
Ascochyta compositarum
Sclerotium sclerotiorum
- Hieracium lanatum* Michx.
Cylindrosporium Hieracis
Phyllosticta Hieracis
Phyllosticta Hieracis
Ramularia Hieracis
Septoria Hieracis
- Heuchera Richardsonii* R. Br.
Puccinia Heucherae
- Hieracium canadense* Michx.
Puccinia hieracialis
- Hieracium subtriacatum*
 Schwein.
Puccinia Hieraci
- Hordium jubatum* L.
Erysiphe graminis
Puccinia Clematidis
P. graminis
P. Impatiens
Septoria Parnassii
Ustilago Lomatoglossae
- Humulus lupulus* L.
Colletotrichum Humuli
Pseudopezizomycetes Humuli
Sphaerotheca Humuli

- Impatiens biflora* Walt.
Plasmopara obdusca
Puccinia Impatiens
- Iris versicolor* L.
Puccinia Majanthas
- Iris versicolor* Nutt.
Basidiophora Kellermanii
Phyllosticta crassula
Sclerotinia sclerotiorum
Septoria crassula
- Juncus balticus* Willd.
Uromyces Junci
- Juncus Doddsii* Wang.
Uromyces Junci
- Juncus Aliformis* L.
Uromyces Junci
- Juniperus sibirica* Burgsd.
Gyrodactylospora ? ger-
 munda
- Koeleria gracilis* Pers.
Puccinia graminis
- Lactaria scariosa* (L., Hill)
Puccinia Lactidis
Septoria Lactidis
- Lactuca pulchella* (Pursh) DC.
Bremia lactucae
Oospora Carltoni
Puccinia lactucae
P. lactucae
- Lappula deflexa* (Wahl.) Garcke
Erysiphe Cichoriacearum
Ramularia Lappulae
- Lappula Lappula* (L.) Karst.
Corticoseptoria Lappulae
- Lathyrus scroloideus* Hook.
Uromyces Fabae
- Lathyrus ruscus* Muhl.
Cercospora Lathyraci
Erysiphe Polygoni
Microspora diffusa
Septoria Astragali
Uromyces Fabae
- Ledum groenlandicum* Oeder
Melanconopezia stricta
M. ledicola
- Leonodon Taraxacum* L.
Puccinia Hesperis
Ramularia Taraxaci
*Sphaerotheca Humuli ful-
 ginea*
- Lepargyreus canadensis* (L.)
 Greene
*Puccinia Carica-Shap-
 herdianae*
Septoria Shepherdiae
*Sphaerotheca Humuli ful-
 ginea*
- Lepidium densiflorum* Schrad.
Albugo caudata
Puccinospora parasitica
Septoria lepidicola
- Lepidium canadense* (L.) Britton
Septoria Eriogonae
- Linnaea borealis* var. *americana*
 (Pursh) Rehdar
Habenaria Linnaea
Venturia Dickelii
- Linum Linum* Pursh
Melanconopezia Lin.
- Lonicera canadensis* Marsh.
Glomerulicium Lonicerae
- Lonicera glaucescens* Rydb.
Cercospora antipus
- Lonicera Sulcicarpa* A. Gray
Cercospora antipus
*Microspora Alni Loni-
 ceris*
- Lycopodium juncea* (Pursh) Don
Puccinia Grisebiana
- Malva rotundifolia* L.
Cercospora malvarum
Puccinia malvarum
Septoria heterochroa
- Mahoeastrum coccineum* (Nutt.)
 Gray
Puccinia Sherardiana
- Menispermum canadense* L.
Cercospora Menispermum
Entyloma Menispermum
Phyllosticta abortiva
Septoria abortiva

- Mencha glabrior* (Hook.) Rydb.
Erysiphe Cichoracearum
Puccinia angustata
P. Menchae
Septoria ranunculicola
- Menthaefolia trifoliata* L.
Phyodermis Menthaefolia
- Mercuria serrulata* (Nutt.) Walp.
Puccinia Peckii
- Micranthes lobata* (Michx.) Greene
Septoria Siegi
- Mimulus ringens* L.
Septoria Mimuli
- Mitella nuda* L.
Puccinia Heucheriae
- Moldavia*. See *Dracoccephalum*
- Monarda fistulosa* L.
Puccinia Monthae
- Monarda mollis* L.
Puccinia Monthae
- Monotropa Nuttalliana* (Schultes) Engelm.
Albugo Elia
- Muhlenbergia marxiana* (L.) Trin.
Phyllostachya graminis
- Myrica gale* L.
Ceanothium Comptoniae
Ovularia destructiva
- Nabalus albus* (L.) Hook.
Puccinia hirsutula
Septoria Nabali
- Nandenbergia thyrsiflora* (L.) Duby
Puccinia lymnæschista
- Nastia paniculata* (L.) Desv.
Albugo candida
Cercospora Nastiae
- Nastia albastrata* (L.) Britt.
Albugo candida
- Oenothera biennis* L.
Peronospora Arthuri
Puccinia Peckii
Septoria Oenotherae
- Oligoneuron canadense* Rydb.
Puccinia Asterium
Septoria solidaginicola
- Osmorhiza occidentalis* McK.
Puccinia apocrypta
- Osmorhiza longistylis* (Torr.) DC.
Cercospora Osmorhizae
Puccinia Pimpinellae
Septoria Asagodi
- Ostrya* sp.
Uromyces punctatus
- Podus virginiana* (L.) Mill.
Cylindrosporium latoserens
Phyllosticta innumerable
P. virginiana
Podosphaera Oxyacanthae
- Panicularia grandis* (Wats.) Nash
Ascochyta graminicola
Claviceps purpurea
- Panicum capillare* L.
Phyllostachya graminis
- Parthenocissus quinquefolia* (L.) Planch.
Cercospora Anaplospoides
Phyllosticta viticola
Uromyces necator
- Pentstemon arvensis* Dougl.
Puccinia Anemopogonis
Septoria pentstemonicola
S. Pentstemonis
- Pericaria Hartwegiana* (Gray) Greene
Puccinia Polygoni-amphibi
- Pericaria Muhlenbergii* (Blanc.) Small
Puccinia Polygoni-amphibi
Reticularia anacardi
R. rufomaculosa
- Peronospora Perispermis* (L.) Small
Septoria Polygonorum
- Petalostemon candidus* (Willd.) Michx.
Ascidium Orobrychidis
Synchytrium aureum

- Phalaris arundinacea* L.
Claviceps purpurea
Puccinia graminis
P. Majusculae
- Pharagmus Pharagmus* (L.)
 Karst.
Hedotrichum linsae
Puccinia Magnesium
P. rubella
Ustilago grandis
- Phyechia heterophylla* Ness
Puccinia Phyalidis
- Phyechia lanceolata* Michx.
Ascomaria Soiana
Eutyloma australe
- Phyechia virginiana* Mill
Puccinia Phyalidis
- Physoclepis virginiana* (L.)
 Berth.
Septoria Physoclepis
- Pinus canadensis* (Mill.) B.S.P
Potodermium coloradense
- Pinus Mariana* (Mill.) B.S.P
Melanosporella abietis
M. laticola
- Pinus Banksiana* Lamb
Cladosporeum Solidaginis
Oromyces Comptoniae
Hypodermella ampla
Lophodermium Pinastri
- Pinus* sp.
Cronartium quercuum
- Pholago major* L.
Erysiphe Cichoracearum
Puccinia alta
Phyllosticta plantaginicola
Septoria plantaginis
- Poa arida* Vasey
Puccinia Clematidis
- Poa crocata* Michx.
Erysiphe graminis
- Poa triflora* Gilb.
Erysiphe graminis
- Polypodium Seneci* L.
Ascidium polygalinum
- Polygonum amphibium* L.
Puccinia Polygoni-am-
phibia
- Polygonum aviculare* L.
Cercospora avicularis
Erysiphe Polygoni
Uromyces Polygoni
- Polygonum erectum* L.
Hamulana rotundifolia
Uromyces Polygoni
- Populus balsamifera* L.
Heterospora Castagnei
Septoria muhlenbergii
S. populicola
Uromyces Salicis
- Populus deltoides* Marsh.
Melanosporella Melanosporella
- Populus tremuloides* Michx.
Cladosporeum subaequalis
Puccinia rotundifolia
Phyllosticta heteromela
Septoria rotundifolia
Septoria muhlenbergii
Uromyces Salicis
- Portulaca oleracea* L.
Albugo Portulacaceae
- Potentilla bipinnatifida* Dougl.
Michx. Dehni
Phragmidium Potentillae
- Potentilla glandulosa* Rydb.
Phragmidium Potentillae
- Potentilla monspeliensis* L.
Michx. Dehni
Raculana arvensis
- Potentilla pensylvanica* L.
Phragmidium Potentillae
- Potentilla* sp.
Phragmidium Ivaense
- Prunus Scabra* Bailey
Exospora Cerasi
- Prunus pennsylvanica*
Cylindrosporium hispidum
- Prunella vulgaris* Pursh.
Gloeosporium Prunellae

- Polystella ludoviciana* (Nutt.)
Heller
 Polythelia suffusa
 Uromyces Anemones
- Pteris aquilina* L.
 Cryptomyces Pteridis
- Pteris nodulosa* (Michx.)
Kew
 Uredinopsis Struthiopteridis
- Pyrola americana* Sweet
 Melampsoropsis Pyrolae
 Pucciniastrum Pyrolae
- Pyrola asarifolia* Michx.
 Melampsoropsis Pyrolae
- Quercus macrocarpa* Michx.
 Marsonia Martin
 Microspheera calyculato-
 phora
 Phyllosticta brevis
 P. phomiformis
 Tapinura corymbosens
- Radiola polystria* (L.) Morsch
 Albugo candida
- Ranunculus abortivus* L.
 Ascochyta trifurcata
 Uromyces Alopecuri
- Ranunculus delphinifolius* Torr.
 Dothidea ranunculus
- Ranunculus Menziesii* Brit.
 Entyloma Ranunculi
 Uromyces Alopecuri
- Ranunculus acris* L.
 Uromyces Alopecuri
- Rhamnus alnifolia* L'Her.
 Cercospora Rhamni
 Puccinia coronata
- Rhus glabra* L.
 Sphaerotheca Humuli
- Ribes americanum* Mill.
 Puccinia Grossulariae
 Sphaerotheca mosc-urae
- Ribes triste* Pall.
 Puccinia Ribis
- Rosa acicularis* Lindl.
 Phragmidium *Rosae-*
 acicularis
- Rosa blanda* Art.
 Cercospora rosaeola
 Ribes speciosa
 Phragmidium montivagum
 Sphaerotheca Humuli
- Rubus arcticus* L.
 Pucciniastrum arcticum
 Sphaerotheca Humuli
- Rubus pubescens* Raf.
 Gymnospora orbiculata
 Phyllosticta Doernumii
 Pucciniastrum arcticum
 Septoria Rubi
- Rubus strigosus* Michx.
 Dicymosphaeria macro-
 bicus
 Phragmidium montana
- Rudbeckia anglica* A. Nels.
 Colletotrichum Rudbeckiae
 Erysiphe Cichoracearum
 Phyllosticta Rudbeckiae
 Plasmopara Halstedii
 Ramularia Rudbeckiae
 Septoria Rudbeckiae
 Uromyces perignatus
 U. Rudbeckiae
- Rumex crispus* L.
 Ramularia decipiens
- Rumex obtusifolius* Moench.
 Puccinia ornata
 P. rubella
- Rumex occidentalis* B. Wats.
 Puccinia rubida
- Rumex venosus* Pursh
 Ramularia decipiens
- Sabina arbuscula* (Moench)
Rydb.
 Gymnosporangium con-
 culare
 G. juvenescens
- Sagittaria latifolia* Willd.
 Cercospora Sagittariae
 Dothidea delormans
 D. furva
 D. intermedia
 Gloeosporium confusum
 Rhynchosporium Alanatum

Scler cordata Muhl.
Malospora Humboldtiana

Scler spp.
Malospora Bigelowii
Ramularia rosea
Rhytisma salicinum
Septoria salicina
Uromyces Salicis

Sclerola marylandica L.
Puccinia marylandica

Scleroglypta scoparium
 (Michx.) Nash
Puccinia Andropogonis

Scleris arvensis Muhl.
Puccinia angustata

Scleris cyperinus (L.) Kunth
Puccinia angustata

Scleris microcarpa Presl
Puccinia angustata

Scleris robusta Vahl
Septoria nervosa
Uromyces Scleris

Scleris festuacea (Willd.)
 Link

Claviceps purpurea
Puccinia coronata

Scleris umbellata L.
Septoria Scutellariae

Scleris infundata (Soland.)
 Rydb.
Phragmidium Potentillae

Scleris cilata (Pursh) G. Don.
Puccinia Potentillae

Scleris arvensis L.
Asbugo candida

Scleris angustifolium
 Miller
Uromyces Scleris

Scleris depressum Gmel.
Puccinia depressum
Septoria Scleris

Scleris herbacea L.
Metasphaeria Doornae
Phyllosticta hispida
P. strobilacea

Scleris herbacea L.—cont.
Puccinia amphigena
Ramularia subulata
Stagonospora Smilacis
Verticillaria Liliacearum

Scleris triflorum Nutt.
Entyloma viciae

Scleris canadensis L.
Colosporium Solidaginis

Scleris pubescens (Rydb.)
 Snyth
Colosporium Solidaginis
Ramularia virginiana

Scleris nemoralis Art.
Puccinia Asterum

Scleris atrolinea Art.
Colosporium Solidaginis
Puccinia Asterum

Scleris arvensis L.
Marasmius Bonchi
Scutellaria scutellariae
Septoria Bonchi arvensis
S. scutellariae

Scleris scopulina Greene
Entosporium maculatum
Cynosporium cornutum

Scleris gracilis Trin.
Puccinia Distichidae

Scleris pectinata Boer.
Claviceps purpurea
Puccinia Distichidae
Uromyces acuminatus

Scleris alba Du Roi
Cercospora rubigo
Cylindrosporium salicicola

Scleris polytrichae (L.) Schleiden
Tricorys Lemnace

Scleris cryptandrus (Torr.)
 A. Gray
Puccinia graminis

- Stachys palustris* L.
Erysiphe Galioideis
Septoria Stachydis
- Stellaria ciliatum* (L.) Raf.
Phyllosticta decidua
Puccinia Dianthidis
Ramularia Lysimachiae
Septoria coccinea
- Stellaria media* (L.) Vill.
Septoria Stellariae
- Stipa comata* Trin. & Rup.
Puccinia Stipae
- Stipa spartea* Trin.
Puccinia Stipae
- Stipa viridula* Trin.
Claviceps purpurea
Puccinia sceleridis
Ustilago hypodytes
- Symphoricarpos occidentalis*
Hook.
Cercospora Symphoricarpi
Microphasma Symphoricarpi
Puccinia abundans
Septoria Symphoricarpi
- Thalictrum dasycarpum* Fisch. & Al.
Erysiphe Polygoni
Puccinia Clematidis
- Thalictrum flavum* L.
Entyloma Thalictri
Erysiphe Polygoni
Mycothiaella Thalictri
Phytophthora Thalictri
- Thalictrum venulosum* Treil.
Polythala Thalictri
Puccinia clematidis
- Thalictrum* spp.
Cylindrosporium Thalictri
Septoria Thalictri
- Thymus ciliolatus* (Muhl.) Small
Ramularia ciliolata
Ustilago nemoralis
- Trisetia odorata* (L.) Hitch.
Puccinia graminis
- Toxicodendron radicans* (L.) Koe.
Cercospora rhoeo
Cylindrosporium Toxicodendri
Pileolaria Toxicodendri
- Trisetia sagittatum* (L.) Small
Gloeosporium Polygoni
- Trisetia americana* Pursh
Ramularia Magnusana
Septoria incrustata
- Trisetia spicatum* (L.) Richt.
Puccinia mesoica
- Urtica canadensis* (Desf.) Greene
Cercospora subangustata
Puccinia Maganthae
- Urtica gracilis* Ait.
Puccinia articulata
Ramularia Urticae
- Urtica Lythra* S. Wats.
Puccinia articulata
- Urticarium diversicaule* (L.) Koe.
Septoria Urticae
- Vaccinium canadense* Richards.
Venturia compacta
- Vaccinium* spp.
Calypsotheca coccinea
Ectoheridium Vaccinae
- Vagaria stellata* (L.) Morong
Cercospora subangustata
Phyllosticta Convolvulariae
Puccinia Maganthae
- Viburnum Lantana* L.
Microphasma Alni
- Viburnum Opulus* L.
Cercospora Opuli
Plasmopara Viburni
Ramularia Viburni
- Viburnum pinnatifidum* Pylea
Puccinia Linnae
- Viburnum pubescens* (Ait.) Pursh
Cercospora varia
Phyllosticta Lantaginis

Viola americana Muhl.
Pezonospora Violas
Oromyces Violas
U. porosa

Viola adunca J. E. Smith
Puccinia Violas

Viola canadensis L.
Phyllosticta Violas
Puccinia Violas
Septoria Violas

Viola pedata G. Don.
Puccinia Violas

Viola spp.
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Ramularia ionophila

Viola missouriensis L.
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Ascochyta *Thaapsii*
Puccinia *Angelicae*

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